TEXTILE WORLD

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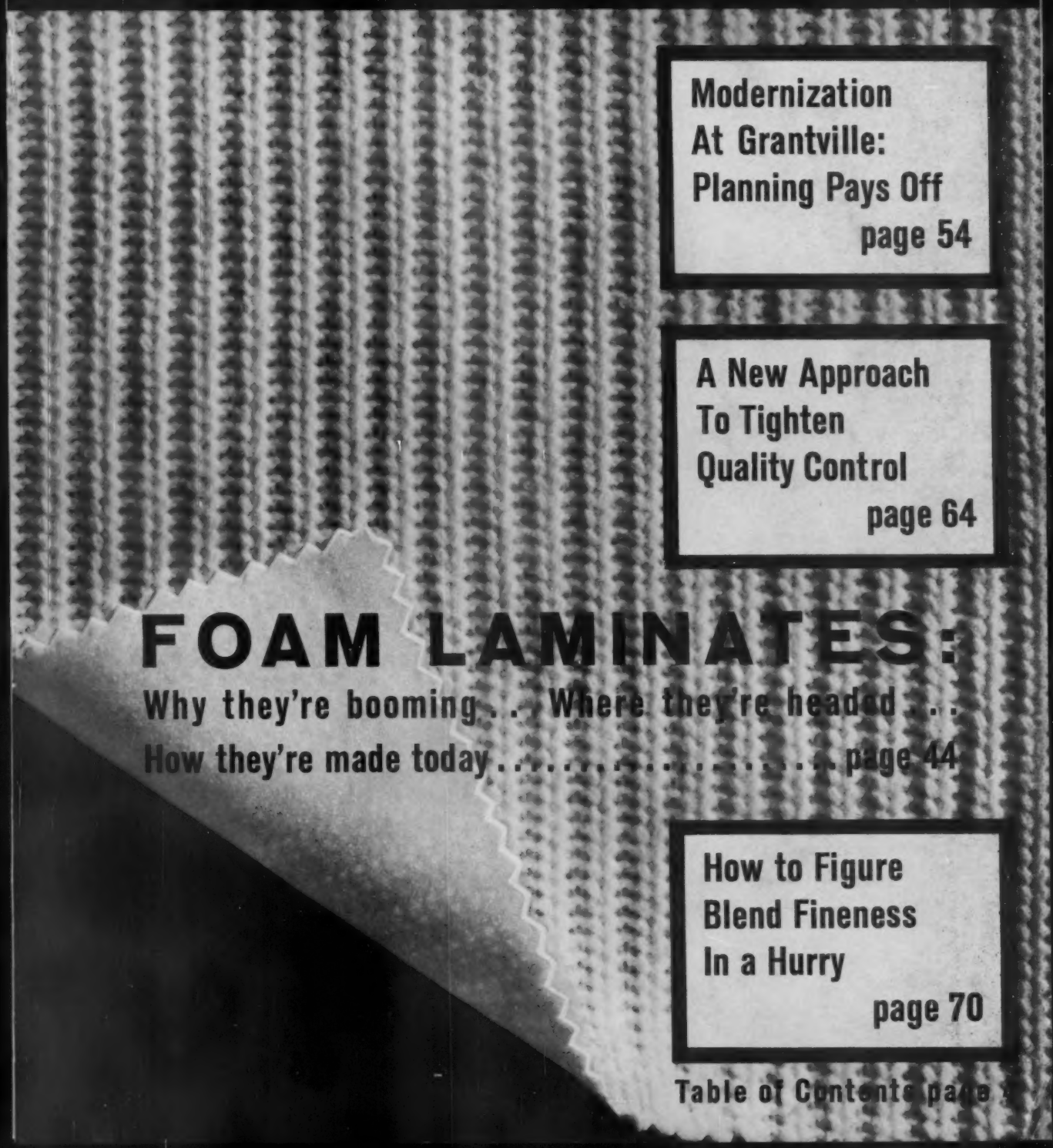

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Air Conditioning helps **FLAGG · UTICA** *get Peak Efficiency at Grantville Mills*

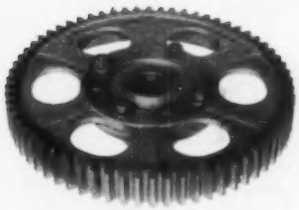
Grantville Mills modern winder room is shown in large photo. Note diffuser for distributing temperature controlled air and atomizers to maintain humidity. Insert shows compressor fan unit and air washer.

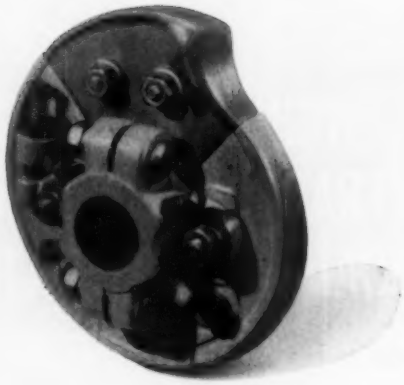
When Flagg-Utica Corporation, producers of quality knit-wear, acquired the Grantville Mills at Grantville, Georgia, they launched a complete modernization program. Realizing that modern high-speed machinery performs best in a controlled atmosphere, the decision was made to refrigerate the yarn mill.

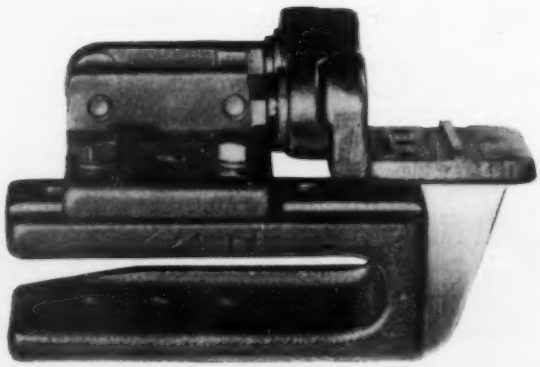
Robert and Company Associates was commissioned to design the system, take competitive bids and supervise the installations, to assure Flagg-Utica of accurate climatic control at minimum cost.

If air conditioning is included in your modernization plans take advantage of Robert & Company's 42 years experience in working with the leaders in the textile industry.

ROBERT AND COMPANY ASSOCIATES
Textile Engineering Division
ATLANTA





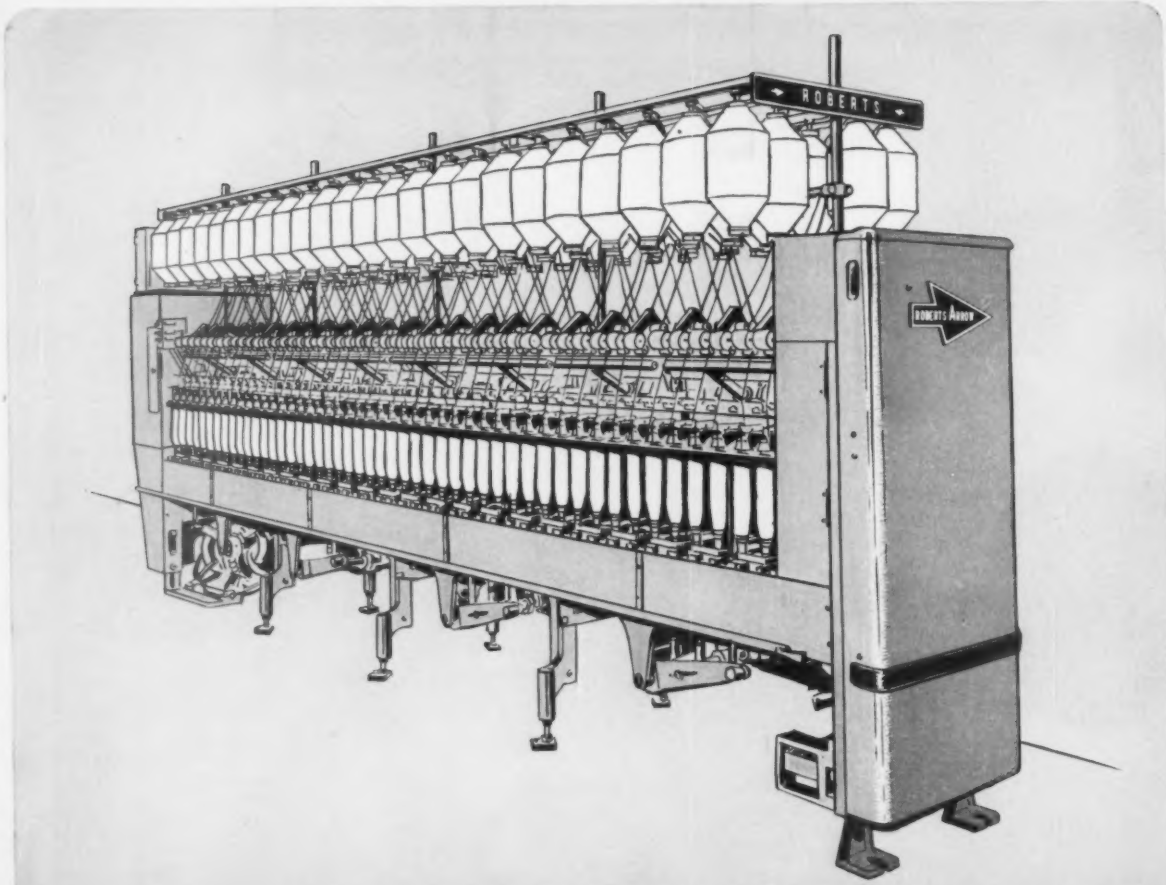


Draper repair parts are designed to give the maximum in loom performance ...day in, day out ...year after year.

DRAPER CORPORATION

The Mark of Quality

HOPEDALE, MASS. • ATLANTA, GA. • GREENSBORO, N.C. • SPARTANBURG, S.C.



ROBERTS ARROW

ADVANCED ENGINEERING DESIGN
ATTRACTIVE LOW PRICE
PRACTICAL MILL OPERATION

1200 NEW ROBERTS ARROW Spinning Frames with some 380,000 spindles have been installed in mills since their introduction four years ago; dramatic testimony that Arrow Spinning does the job to mill satisfaction!

RUGGED, ALL BALL BEARING and free of gadgetry and frills, new Arrow Spinning has been refined and streamlined, and engineered for peak performance and dependability. Many technological improvements have been incorporated.

HIGHEST YARN QUALITY! With new FC Drafting cotton system spinning, Arrow Frames consistently spin stronger, more even yarns. Proper fiber control, gripping and weight assure superior yarn quality.

INCREASED SPEEDS! Spindle speeds to 15,000 r.p.m., dynamic balancing of all components, and maximum use of ball bearings provide increased production and economy, with smooth and dependable performance.

WIDER VERSATILITY! Coarse or fine yarns from 2s to 120s count, cotton or synthetics and blends, and a broad range of drafts from 10 to 60 are successfully handled. New Arrow Spinning spins short or long staple cotton, and synthetics from 1 1/16" to 3". Changes in fiber, yarn number, draft, twist and bobbin build are quickly accomplished.

REDUCED CLEANING, MAINTENANCE! Strictly functional, new Arrow Spinning has been engineered for trouble-free operation with reduced cleaning and maintenance. Simplification of components, and fewer parts provide quick, easy cleaning.

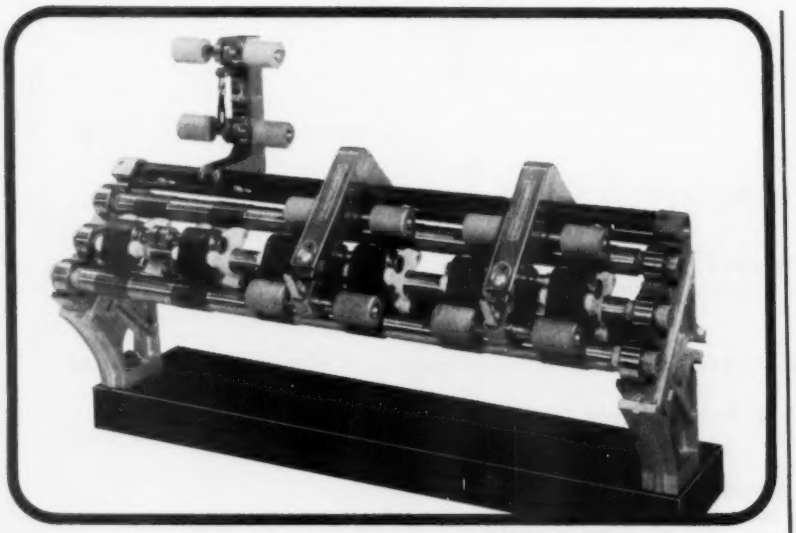
ROBERTS COMPANY
SANFORD, NORTH CAROLINA

YARN MAKING MACHINERY

ROBERTS NEWS

COTTON, WORSTED OR LONG FIBER SYSTEMS

Roberts FC Drafting System . . . Cleanest, Simplest, Best Yarn Quality



FC Drafting clears roll beam of all weighting attachments. Ball bearing bottom rolls on all three lines, shown above, are optional.

- Cleanest Running — Easiest to Clean
- Simplest — Fewest Number of Parts
- Highest Yarn Quality — Stronger, More Even Yarns
- Broadest Versatility — Cotton, Synthetics, Blends
- Short or Long Staple — Synthetics 1⅛" to 3"
- Coarse or Fine Yarns — 2s to 120s
- High Draft — 10 through 60
- Cartridge Weighting
- Roll Beam Clean — No Weighting Attachments
- No Lever Screws, Weight Levers and Hooks, Dead Weights
- PosiWate Pendular Arm Suspension — Positive Weighting
- No Oil in Entire Drafting Zone
- 3 Lines Ball Bearing Top Rolls
- Ball Bearing Bottom Rolls Optional
- Hardened Bottom Rolls with EvenGrip Fluting
- Nylon Cradles with Choice of Pin Opening
- Reduces Weight on Frame by ¾ of a Ton

ROBERTS COMPANY **Sanford, North Carolina**

Arrow Spinning Frames for Cotton and Worsted Systems • Twisters and Roving Frames
Tow-Transformers • ParaBlenders • ParaDrafters • AutoEveners

Roberts Company has achieved a most precision made cotton spinning system with its FC Drafting. It is the cleanest running, and the simplest with the fewest number of parts. It consistently gives the highest yarn quality from spindle to spindle and from year to year.

Dramatically new and improved in FC Drafting is a cartridge weighting arrangement which eliminates all weighting attachments to the roll beam, disposing of the lever screw, weight lever, weight hook and dead weight.

Used instead is an enclosed spring cartridge attached to a cartridge bar fastened between roll stands. A simple lever is depressed to unweight or to weight up the top rolls. There are no short springs inside the pendular suspension.

WIDE VERSATILITY

Coarse or fine yarns from 2s to 120s, cotton or synthetics and blends, and a broad range of drafts from 10 to 60, are efficiently handled by new FC Drafting.

Proper, efficient fiber control, fiber gripping and weight is provided without the limitations of other systems using short springs, weights or magnets.

FC Drafting can be arranged to handle short or long staple cotton, and synthetic fibers from 1⅜" to 3" long. A choice of cradle lengths and solid or recessed apron top rolls provides this flexibility.

One arrangement handles cotton up to 1⅜" long and synthetic fibers 1⅜". Recessed top apron rolls may be used for synthetics of 2" to 2½" long. Another arrangement handles regular running of long staple cotton up to 1⅜", or synthetics of 2" and less. The recessed roll extends this to 3" synthetics.

Send for Bulletin. **For further information on Roberts FC Drafting write for Technical Bulletin FC-101.**

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Coming Next Month:

A New Light On Fiber Tensile Strain

You'll get new facts about fiber tensile strain in **September TEXTILE WORLD**. A comprehensive independent university study on seven natural and man-made fibers comes up with fiber recovery facts that will help you in manufacturing textiles and predicting end-use performance. It's complete with easy-to-read charts and graphs

Also in September, you'll learn how one integrated mill, processing many sizes and blends of fabrics, has slashed its yarn manufacturing costs.

Fabric in cover photo: Curon Div., Reeves Brothers, Inc.

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NEWS! ONLY V-BELTS BY GOODYEAR

to give you sets matched in length to pull together

What's more, Green Seal V-Belts give you—

True dimensional stability for the life of the belt—built in through the use of shrink- and stretch-resistant 3-T Process Cord or airplane-type steel cable.

Mildew-inhibited construction for protection in damp operating conditions.

Widest selection from the most complete V-belt line anywhere.

Ready availability from distributor stocks in every part of the country.

Technical assistance whenever it's needed from a qualified expert, the G.T.M.—Goodyear Technical Man.

For the best buy in V-belts call your Goodyear Distributor. Or write Goodyear, Industrial Products Division, Akron 16, Ohio.

Lots of good things come from GOODYEAR

GREEN ✿ SEAL ARE CODED TO 1/32"...

perfectly for longer, more trouble-free service

LENGTH-CODING GREEN SEAL V-BELTS TO 1/32"—NOT JUST 1/10", LIKE MOST BELTS—takes this ultra-precision machine. Only Goodyear has this type equipment, which is set by means of fine tolerance steel templates to insure accuracy. Machine readings are in the actual code numbers used to eliminate errors.

Green Seal—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

YEAR INDUSTRIAL PRODUCTS

NEW HONEYWELL TRANSMITTERS

New pneumatic bellows flow transmitter

gives all the economy and convenience of pneumatic transmission and all the efficiency of the bellows meter body with the added option of field indication. The transmitter has 16 ranges (0-10 to 0-400 inches of water) and is used to transmit flow or liquid level measurements in open or closed tanks.

Transmitter Features: Make range changes in the field simply by replacing a single spring assembly. You can adjust damping quickly and accurately while the instrument is in operation. You can install meter with vertical or horizontal piping, so that it vents, drains and purges itself.

New pneumatic temperature transmitter

offers thermal system options with ranges from −125° to 1000°F. Completely new, completely flexible, this transmitter gives you a choice of either mercury or gas actuated thermal system with a wide selection of measuring bulb styles.

Transmitter Features: Mount transmitter on a pipe welded to flow line or on a bracket that clamps to hex head of socket. Vibration resistant thermal system means accurate measurement on vibrating flow lines.

Added Features of both transmitters are: automatic ambient temperature compensation; two-way overload protection (100% of span on temperature transmitters, 100% of rated meter body pressure on bellows flow transmitters); modular construction for simplified maintenance; self-locking feature to prevent upset; die-cast aluminum case 4″ x 7″ x 9″; available with concentric scale or as non-indicator; transmission accuracy ±0.5% full scale; accuracy of indication ±1% full scale.

For more complete details on the new temperature and bellows flow transmitters, call your nearby Honeywell field engineer. Or write MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa. In Canada, Honeywell Controls, Ltd., Toronto 17, Ontario.

Honeywell

First in Control

SINCE 1885

HONEYWELL INTERNATIONAL Sales and Service offices in all principal cities of the world. Manufacturing in United States, United Kingdom, Canada, Netherlands, Germany, France, Japan.

Changing styles or regular run . . .

Batson has the right take-up roll coverings for you

For crease-free, slip-free, even-rolling cloth BATSON IS YOUR ONE SOURCE FOR ALL YOUR TAKE-UP ROLL COVERINGS

Because Batson has the widest assortment of use-tested take-up roll coverings . . . because Batson's fast delivery and proved service means your roll coverings are on the spot when you need them, ready for easy application . . . and all your Batson take-up roll coverings are long-wearing, resilient . . . they hold, yet treat your finest fabrics tenderly. Make Batson your prime source, your *one* source for take-up roll coverings for weave room, finishing plant or cloth room.

Louis P. Batson Company

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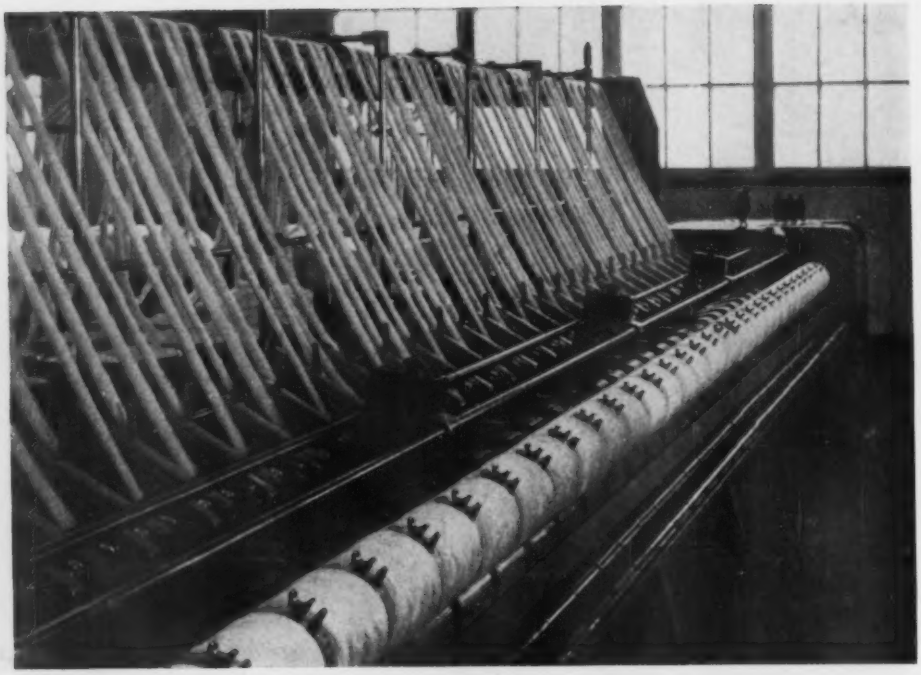


High Draft Finisher, model KSD

4 to 20 heads with 2 bobbins each

Double sliver

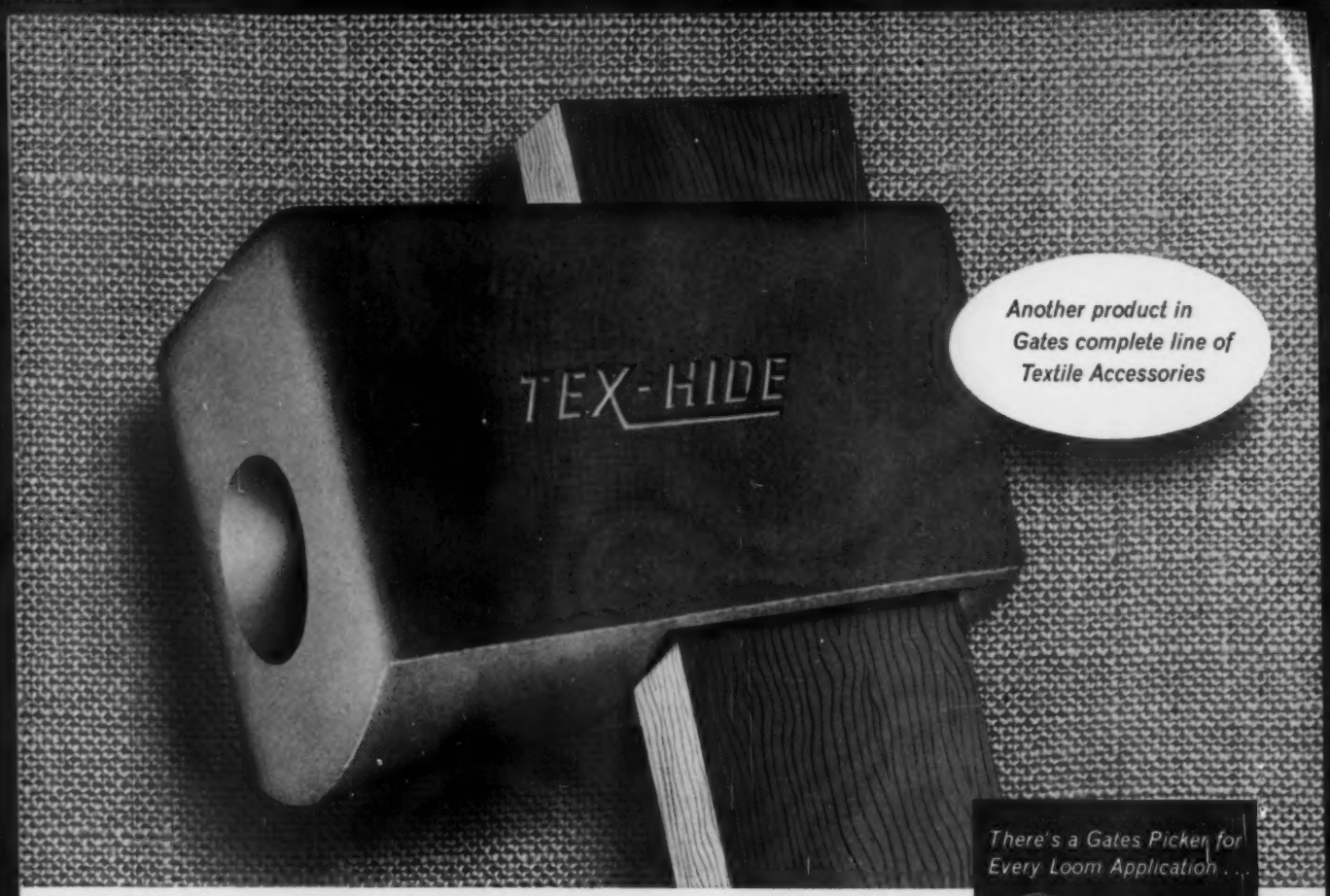
Delivery speed up to 50 m/min. (164 ft./min.)

Draft 10 to 28

Ratch adjustable by hand crank

Capitalize on our experiences gathered in the course of many years.
Our experts will be glad to advise you on the planning and modernization of complete spinning mills for cotton, worsted, staple and man-made fibres.

INGOLSTADT DEUTSCHER SPINNEREIMASCHINENBAU INGOLSTADT



Another product in Gates complete line of Textile Accessories

Smoother loom operation makes Gates Tex-Hide Loop Pickers No. 1 choice of leading mills*

Gates Tex-Hide is a super-tough, highly resilient material that assures you of exceptionally long service life for loop pickers. Gates Tex-Hide provides all the shock-absorbing capacity and resilience of leather . . . better than any other material, natural or synthetic.

These Loop Pickers catch the shuttle without bounce, preventing filling thread from breaking or sluffing off the bobbin. They run cool, rapidly dissipating the heat generated in catching and throwing the shuttle.

As a result, Gates Tex-Hide Loop Pickers assure smooth loom operation over a long period. They help maintain the highest quality of cloth, and greatly reduce your down-time costs.

For better, faster, more economical production, equip your looms with Gates complete line of textile accessories. Contact your nearby Gates Textile Distributor.

**Names supplied upon request.*

The Gates Rubber Company, Denver, Colorado BP47
Gates Rubber of Canada Ltd., Brantford, Ontario

There's a Gates Picker for Every Loom Application . . .

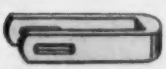
SUPER VULCO PICKER
Newest addition to Gates line of pickers. Pale pink color. Excellent for intermediate applications requiring both economy and durability.

VULCO PICKER—*Molded of rubberized fabric . . . low cost. Designed for use in weaving cottons and specialty-type fabrics where low initial picker cost outweighs all other factors.*

GATES TEXTILE ACCESSORIES

Gates — *Building the future on 50 years of progress*

Tex-Hide Harness Straps



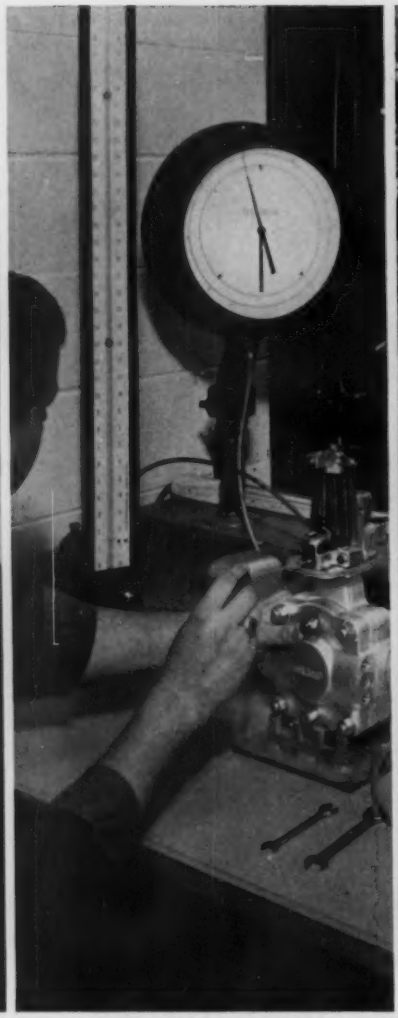
Thin-Tex, Vulco, Tex-Hide and Super Tex-Hide Lug Straps

4-in-one Check Straps

Take-up Roll Coverings
Card Bands Cone and Evener Belts
Spinning Frame Drives

CIRCLE 11 ON READER SERVICE CARD 11

Careful planning by a staff of highly qualified engineers assures quick solution to your emergency instrumentation problems. The engineers are backed by a staff of 10 factory-trained technicians.



Enlarged repair and test facilities now include equipment to calibrate d/p Cell* Transmitters, as well as to build and calibrate filled thermal systems. Emergency repairs take less than 48 hours.

Expanded stock shelves now contain M/40 Recorders and Controllers, Consotrol* instruments, Magnetic Flow Meters, d/p Cell Transmitters, valves—all the standard instruments likely to be needed.

New Foxboro Atlanta Factory Branch quickens the pace of instrumentation service in the Southeast

It's an emergency . . . downtime costs are mounting . . . you need instrumentation help — fast.

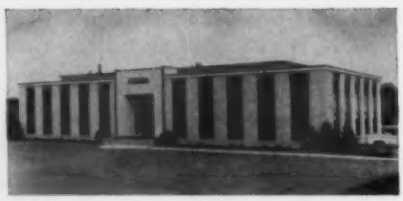
A quick call to your local Foxboro Field Engineer now brings you the expanded instrumentation service of Foxboro's new Atlanta Factory Branch. Here's what happens:

When you need emergency instrument repairs, you'll get 48-hour — *or faster* — repair and test service, from factory-trained technicians at the Atlanta Factory Branch.

When you need complete instruments for emergency replacement, the Atlanta Factory Branch now makes same-day shipment of standard Foxboro instruments used in the Southeast.

When you need replacement parts, Foxboro's Atlanta Factory Branch immediately speeds the parts to your plant from its expanded warehouse facilities. There's no need to stock a large supply of parts at your plant. The Atlanta Factory Branch delivers overnight anywhere in the Southeast.

Remember to ask your local Foxboro Field Engineer about the Emergency Service Network, as well as the Scheduled Service Agreement for preventive maintenance. The full resources of Foxboro's Atlanta Factory Branch stand behind them. The Foxboro Company, 848 Neponset Avenue, Foxboro, Mass.

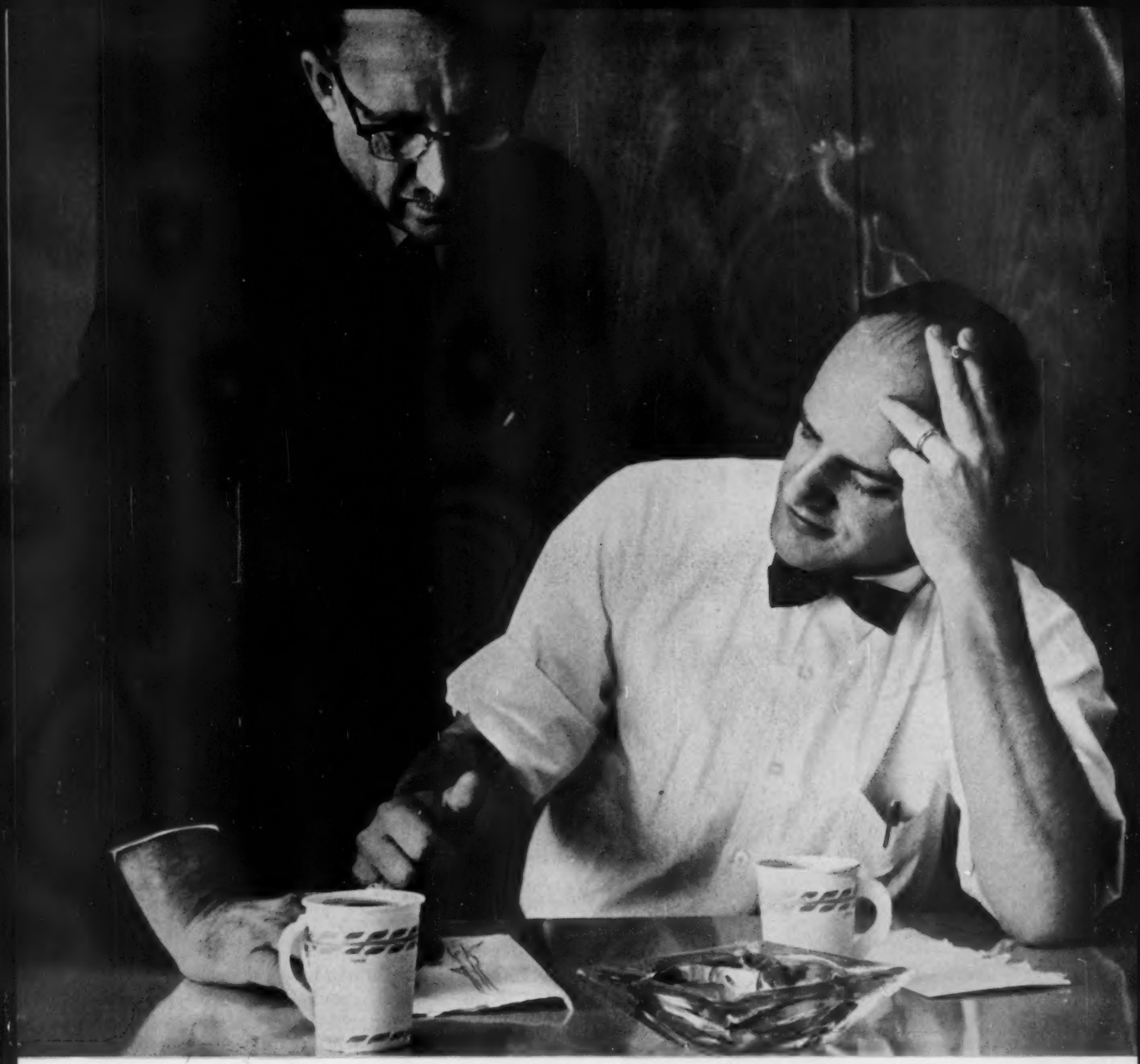


Foxboro's new Atlanta Factory Branch — headquarters for fast instrumentation service.

**Reg. U.S. Pat. Off.*

FOXBORO

REG. U.S. PAT. OFF.



How a coffee break saved 3 hours per frame per year!

It happened one morning about a year ago during coffee break at our Research and Development Center at Clemson. ■ One of our engineers from the Development staff was describing a problem he had run into with a small part on the pilot model of the new Rovematic frame. It didn't have the durability he wanted. A Research Department engineer had a sudden inspiration. He thought of a way to relocate the part so that it would not be subject to as much stress, and consequently should last a lot longer. Coffee momentarily forgotten, the two worked it out, and the change was made. ■ The result is that three hours per year — the down-time that might have been required for the replacement of that particular part — have been eliminated on every single Saco-Lowell Rovematic frame. ■ A lucky accident? Not at all. It expresses our whole philosophy in building our Research and Development Center. Its purpose: to stimulate interaction of skilled and dedicated specialists in an academic atmosphere. No matter what the problem our engineers are tackling, they can turn to other fresh minds for new opinions, new approaches to making better textile machinery and providing better textile service. For, at Saco-Lowell, all our products are **built for better performance . . . backed by better service.**

SACO-LOWELL SHOPS

TEXTILE MACHINERY DIVISION

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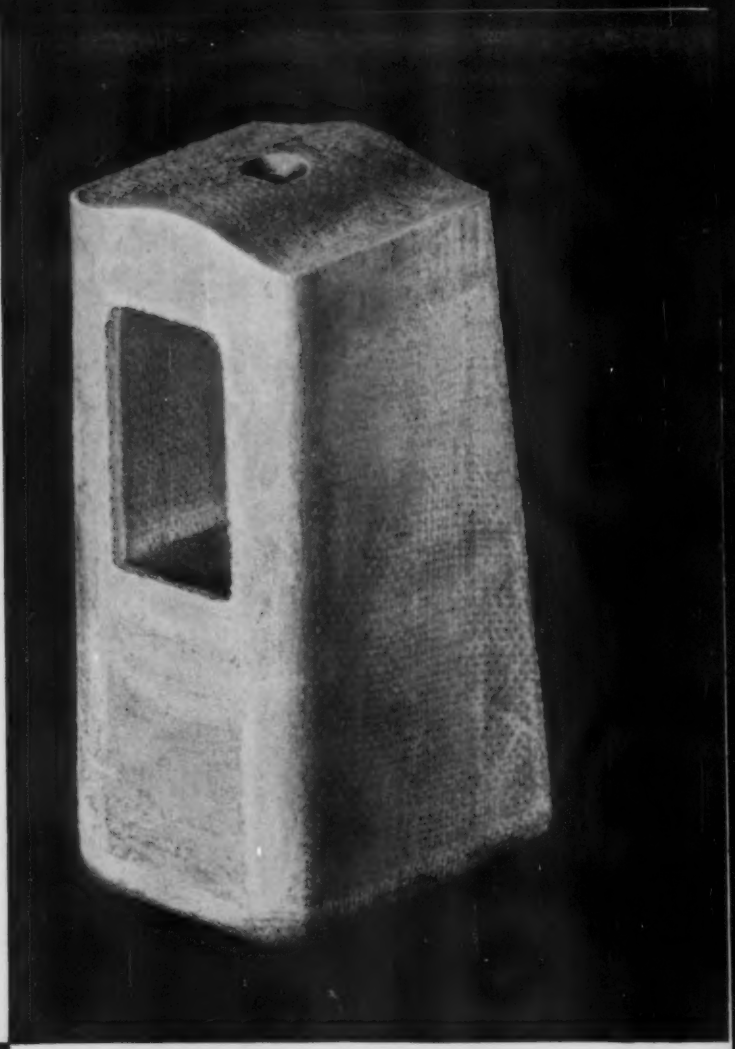
CIRCLE 13 ON READER SERVICE CARD

You name it,
Dayco makes it...

a Thorobred Picker to handle any assignment!



1. Dayco Thorobred Premium Loop Picker, readily identified by its gold back . . . rugged and always reliable.

Newest of Dayco's Thorobred Drop Box Pickers is the Golden Thorobred, fully molded in one piece from an ultra-high molecular polyester. Careful in-use studies show that its life expectancy is 10 times that of the conventional picker. If you've used the Golden Thorobred Drop Box Picker and liked it, you may wish to try the Golden Thorobred Loop Picker, now available in many sizes.

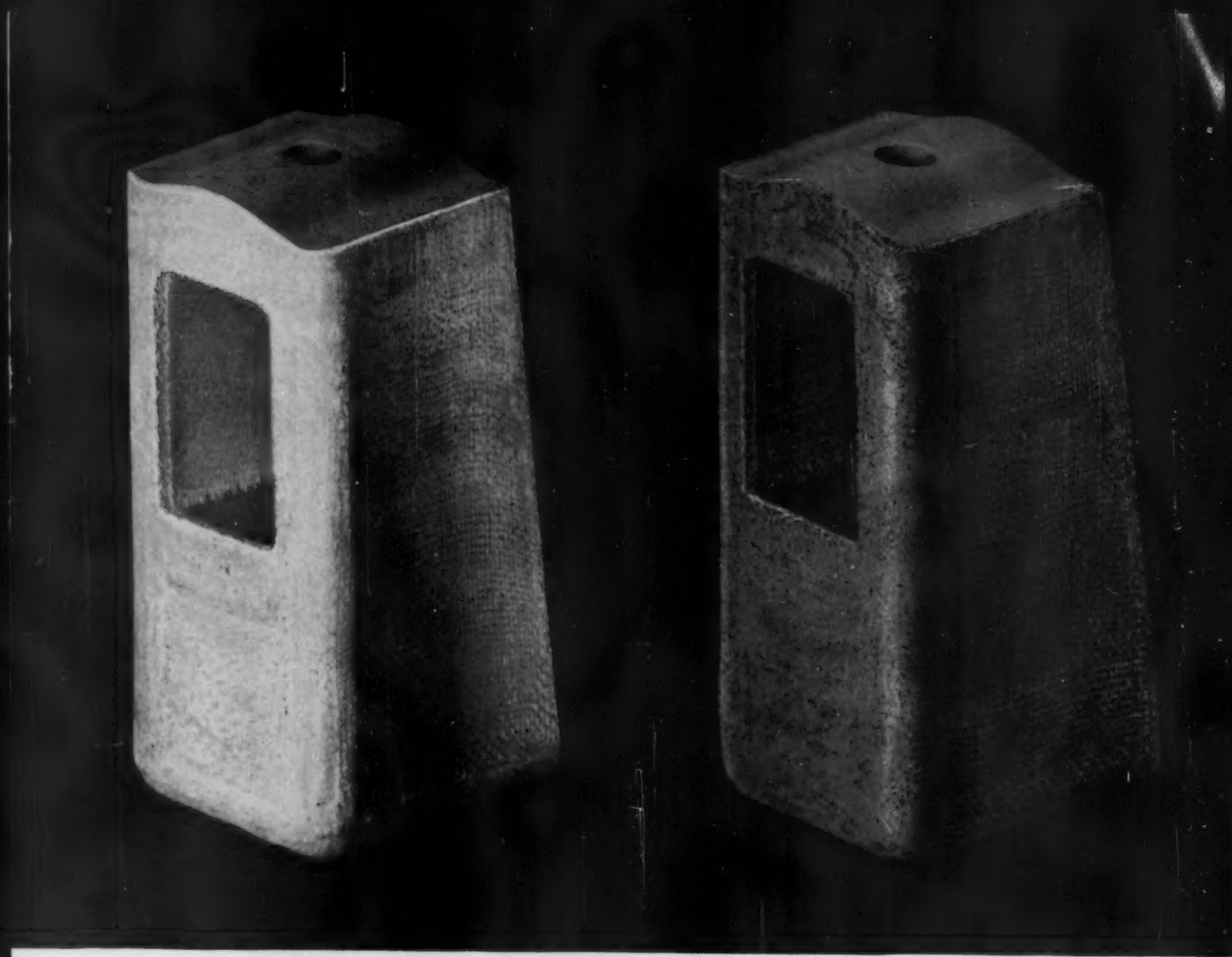
Meet the full family of Dayco Thorobred Loop Pickers! With their help, you'll substitute high production levels for the down-time so often resulting from picker trouble. You'll see the difference in cloth quality that superior picker performance can make. And you'll see a big difference in *quantity*, too.

First, the Dayco Premium Picker. It's really rugged —so sturdy and resilient it amazes even experienced mill men. Once they've become accustomed to its superior performance—even in operations that require the very best—they're sold on Dayco Premium! And little wonder. Keeping perfectly in time through millions of picks, the Premium stays on the job far past normal time for replacement.

Bring On Your Toughest Assignment

Perhaps the best way to explain what the Dayco Premium Picker can do is simply to say: bring on your toughest assignment. See the way that this quality loop picker will tackle it. You'll like what you see.

A second outstanding loop picker from Dayco is the Dayco Thorobred Super. Very likely you're already familiar with the Super, for its record of fine



2. Dayco Thorobred Super Loop Picker, white with red back . . . designed with modern loom requirements in mind.

3. Dayco Thorobred Standard Loop Picker, black with red back . . . for excellent service on E model looms and slower.

performance comes into the conversation almost as often as textile men talk shop together.

Like the Dayco Premium, the Super is fully able to cope with the demands of modern weaving equipment. It's able to withstand the weight of heavier plastic shuttles . . . it's at home with longer quills and higher loom speeds. Use the Dayco Thorobred Super Loop Picker and see if you don't agree: its ability to withstand the continual thrust of the shuttle—without loosening or early wear—is truly impressive.

Pay For What You Need

Economy of operation dictates, of course, that you pay for no more than you need. Yet, even where less is required of a picker, it must fully measure up to what *is* required, or "economy" turns into expense and waste. Dayco again supplies the answer: the Dayco Thorobred Standard Picker, recommended for E Model and slower looms.

Like the Premium and the Super, the Dayco Standard Picker is built in one piece. There's nothing to break or distort when it's driven onto the stick. And, like all Dayco Thorobred Pickers, the Standard gives perfect shuttle contact. The picker-stick hole is slightly tilted. The flared bottom permits easy, accurate seating. And the Standard stays exactly in position, for perfect alignment with the shuttle.

Pick a Dayco Picker

How can a lower-priced picker offer so much? The answer is simple. Dayco engineers design *each* picker to measure up to the demands that will be placed on it. But the same basic principles . . . procedures . . . and precision that help make the Premium as good as it is are adhered to in producing *every* Dayco picker.

Premium, Super and Standard, they're available in many sizes, to meet every possible requirement. So to pick the picker that's best for any given operation, simply contact your Dayco jobber. Or write or phone Dayco Textile Products Co., 401 S.C. National Bank Bldg., Greenville, S. C., for further information. Overseas Plant: The Dayton Rubber Co., Ltd., Dundee, Scotland.

Dayco TEXTILE PRODUCTS

Division of Dayco Corporation

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You will find Ideal Feathertouch Drafting Systems in the finest mills in the Americas – and everywhere they are setting enviable records for tremendous production of the highest quality sliver at low costs.

IDEAL Feathertouch 750

Ideal pioneered in the development of patented spacing sections, high speed coiler assemblies, individual-roll vacuum suction systems, and the Ideal Compact Creel – and in the application of permanently sealed ball bearings and the electro-magnetic clutch. Shown here is the versatile Ideal 750, America's first two delivery frame – with a consistent operating speed of 750 fpm.

It will pay you to get the full facts on Ideal Feathertouch Drafting. Write today.

*Trade Name – Patented

Ideal Industries, Inc.
Bessemer City, N. C.

THE ORIGINATORS OF HIGH SPEED DRAWING

Carbanthrene® Scarlet RBB paste

American Designer Series

Hannah Troy

. . . designed this two-piece dress in rayon crepe, calls the shade Shrimp. It's typical of currently popular pinks that get their good start with Carbanthrene Scarlet RBB Paste.

Vat Red... with a bright new flair for fashion!

New from National Aniline! And timed to provide a bright, clear base for the cycle of pink shades that are currently coming into vogue.

Carbanthrene Scarlet RBB Paste is one of our controlled fine-particle vat dyes recommended for all types of dyeing, but especially for the clean results achieved in all pigment impregnation methods. It is practically unaffected by metals in the dyebath.

This new vat dye combines good resistance to light with very good-to-excellent wet fastness and is particularly suitable for crease-resistant dress goods and suitings.

Write for samples and Bulletin No. 449

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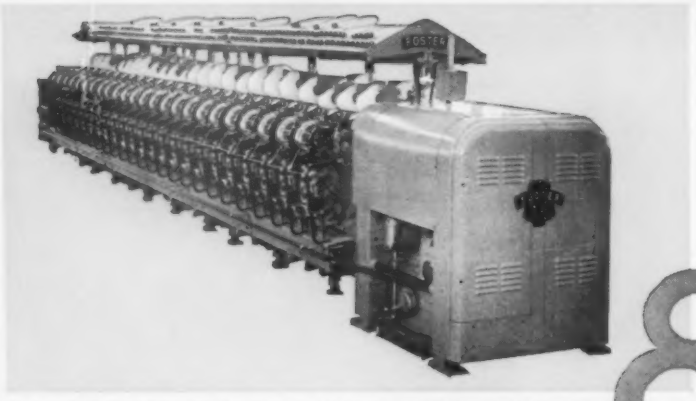
FOSTER MODEL 506 AUTOMATIC YARN WINDER



It's New!

It's Available

NOW!

IT BENEFITS YOU IN THESE 8 WAYS!

1. Increases operator productivity by 50%.*
2. Winds at twice the speed of our manual winder.
3. Requires less floor space than our manual winder.
4. Prevents wild yarn (butterflies), tangles, bobbin rings, crossed ends, uneven package density and rough yarn.
5. Eliminates gauging of package diameter by hand.
6. Winds any type of open wind putup, including a steep taper (9° 36′) knitting cone.
7. The Model 506 cone is an even better package than the Model 102 cone (standard for the sales yarn market for many years), partly due to electronic tension.
8. Investment required is no more than for our manual winders with same capacity.

*Substantiated and documented in mill tests, under production conditions.

AUTOMATIC FEATURES

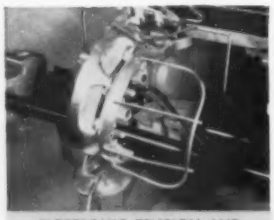
Only those operations which will *not* endanger yarn or package quality have been automated. These include threading up, slubbing and cleaning, disposal of empty bobbins, gauging full cones, donning full bobbins and doffing empty bobbins.

SIMPLIFICATION & SPEEDING UP OF MANUAL OPERATIONS

To keep the mill investment required within practical limits and in order to assure top yarn and package quality, which is so vital to sales yarn spinners, donning and doffing of cones, providing bobbin supply and knot tying are still done manually. However, providing the bobbin supply and tying knots have been so simplified that altogether they require only 10/100 of a minute (see illustrations). Wild yarn, tangles, bobbin rings, crossed ends, uneven package density and rough yarn (which are unavoidable at times with automatic knot tying) are definitely prevented on the Foster Model 506.

SEND FOR MODEL 506 BROCHURE

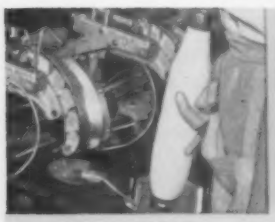
If you are interested in increasing the productivity of your winder operators by 50% in less floor space than you now require; if you are interested in doing this *without* jeopardizing yarn and package quality, find out more about the Foster Model 506 Automatic Winder — send for our brochure, "The Practical Road to Automatic Winding", or ask us to send a representative to talk with you. No obligations.



ELECTRONIC TENSION AND SLUB CATCHER

AUTOMATIC SIZE STOP MECHANISM

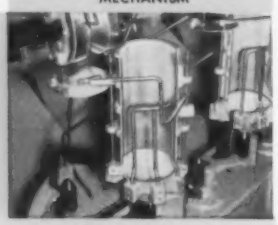
MANUAL OPERATIONS WHICH TAKE ONLY 10/100 OF A MINUTE AND PROTECT YARN QUALITY



DROPPING BOBBIN IN CHUTE

TYING KNOT WITH HIGH SPEED INSTRUMENT AND TESTING — ALL WITH LEFT HAND

RESTARTING SPINDLE WITH RIGHT HAND



AUTOMATIC SUPPLY BOBBIN EXCHANGER

211-1

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A YARN WINDER FOR EVERY PURPOSE

Westfield, Massachusetts, U. S. A.

Member of American Textile Machinery Association

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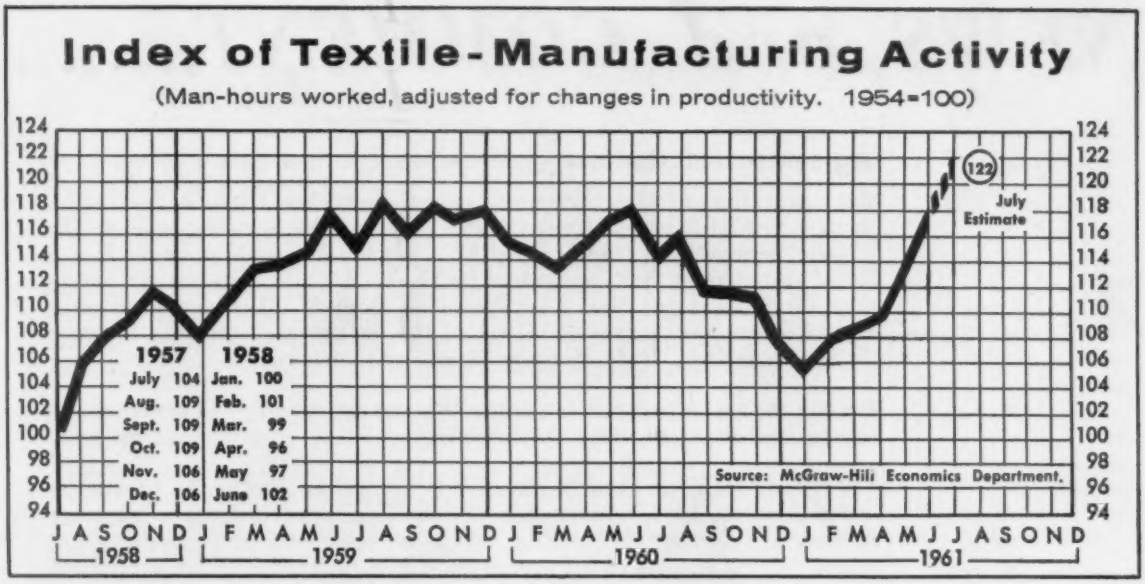


Coming: A New High?

TEXTILE WORLD's exclusive index of textile manufacturing activity climbed 4 points in June to 118—one point shy of the all-time high of 119 in October 1959. And continuing business gains are sure to bring even more increases in textile production in coming months.

●

Total industrial production in June also rose, generating a rise in employment, a lengthening of the work week, and an increase in payrolls. The production rise since the first of the year has been especially encouraging because it has spread across a broad spectrum of industries rather than being concentrated in only a handful of highly cyclical industries.

Personal income has more than recovered from the slight decline of the recession. Advancing in June for the fourth consecutive month, it reached a seasonally adjusted rate of $416.7-billion. Most of the June gain came from an increase in payrolls and rising income of the self-employed.

Retail sales, however, have not fully reflected the gains in personal income. Consumers were apparently edgy about business conditions and the possibility of a job layoff in the early part of this year. But a recent study by the University of Michigan Survey Research Center now suggests that consumer confidence has taken a turn for the better. More consumers are now thinking of buying a new car or new house than in the first quarter of this year. In addition, consumers worked off some of their installment debt burden during the recession months. With rosier business, they can now buy on the cuff again.

Figures of the Month

TEXTILE-INDUSTRY INDICATORS

	Latest Month	Previous Month†	Year Ago
TEXTILE WORLD's Exclusive Index (chart above)	118	114	118
Employment (thousands)[1]	925.7	915.1	961.7
Production Workers (thousands)[1]	832.4	823.0	866.7
Weekly Earnings (dollars)[1]	66.09	64.94	65.53
Hourly Earnings (dollars)[1]	1.64	1.64	1.63
Weekly Hours Worked[1]	40.3	39.6	40.2
Production Index (1957=100)[2]	112	109	115
Wholesale Price Index (1947-49=100)[1]	93.7	94.0	96.3
Manufacturers' Sales (billion $)[3]	1.22*	1.20	1.29
Manufacturers' Inventories (billion $)[3]	2.74*	2.76	2.71
Inventories-to-Sales Ratio	2.25*	2.30	2.10
Exports (million $)[3]	108.5*	140.0	128.1
Imports (million $)[3]	92.4*	85.9	94.5
Stock Price Index (1941-43=100)[4]	28.42	28.81	27.69
Failures[5]	9	10	5

NATIONAL ECONOMIC INDICATORS

Industrial Production (1957=100)[2]	110	108	109
Consumer Price Index (1947-49=100)[1]	127.4	127.4	126.5
Wholesale Price Index (1947-49=100)[1]	118.2	118.7	119.5
Civilian Population (millions)[6]	180.9	180.7	177.9
Unemployment (millions)[6]	5.6	4.8	4.4
Employment (millions)[6]	68.7	66.8	68.6
Personal Income (billion $)[2]‡	416.7	413.2	404.4

* May; otherwise latest month is June. † Revised. ‡ Annual rate.

1. Bureau of Labor Statistics; 2. Federal Reserve Board; 3. Department of Commerce; 4. Standard & Poors; 5. Dun & Bradstreet; 6. Bureau of the Census.

NEWS and COMMENT . . . . . .

Agreement at Geneva

Representatives of 16 nations meeting in Geneva in mid-July agreed unanimously July 21 to accept United States proposals for bringing order to the chaotic international trade in textiles. Agreement came at the end of a 5-day exchange of views sponsored by the U. S. State Department, acting on a directive issued May 2 by President Kennedy. The agreement was signed by representatives of all six of the big-volume exporting nations: Japan, Hong Kong, India, Pakistan, Spain, and Portugal.

Briefly, the Geneva agreement, still subject to approval by the governments represented there, provides the following:

• **A 12-mo. ceiling on exports, effective Oct. 1, at the level of the 12 months ended June 30, 1961.** Any nation that believes exports from a low-wage country are hurting its domestic textile industry may ask the exporting nation to limit exports to the agreed-upon level. Attached to the agreement is a list of some 60 items upon which limits may be imposed.

• **A long-term plan to be developed by a special study group that must report by Apr. 30, 1962.** The group will include representatives of all 16 nations. It will seek a permanent basis for orderly international trade.

• **A relaxation of import restrictions by nations that now impose them—mainly the nations of Western Europe.** These countries are expected to announce increases in permitted imports by Jan. 1, 1962.

Principal import increases would fall to France and Italy. In separate negotiations Hong Kong was asked to accept a 30 to 35½% cut. Japanese were reported unhappy with the slight increase proposed for them.

American textile manufacturers who went to Geneva (at the request of Commerce Secretary Luther Hodges) as advisors to the American delegation offered only restrained comment on the outcome of the conference. Some, commenting on the pressures of international diplomacy and the need to expand world trade, accepted the agreement as the best that could be expected but reserved further judgment until they can see how Washington will implement it. Others indicated by their silence that the conference had not changed their previous position—that nothing short of mandatory unilateral quotas would solve the U. S. textile industry's problems, that the net effect of the conference will be to increase textile imports to the United States, and that much of the value of the conference was lost in limiting it to cotton texiles.

Briefs at Home

Spartanburg, S. C.: Construction will begin "at once" on two Deering-Milliken ventures—a facility for research in cotton processing and spinning, and an addition to present facilities for chemical research. Plans for the former, developed with the Institute of Textile Technology, call for the most advanced design in buildings and equipment. . . . *Memphis:* Apparel uses accounted for 62% of raw cotton in the United States in 1960—up from 61% in 1961 and the highest figure since 1945, says the National Cotton Council in its new booklet, "Cotton Counts Its Customers." Of

the 8.1-million bales used, apparel took 4.3-million bales, household 2.3-million, industrial 1.5-million.

New York: M. Lowenstein & Sons, Inc., and The Mead Corp., paper and paperboard manufacturer, are studying opportunities for joint expansion in textiles through "techniques employed in the manufacture of paper." In June, Mead dedicated a $4.5-million research lab at Chillicothe, Ohio. . . . *Boston:* Though spot buying of wool has slowed, consumption is going at high speed, with mills heavily booked on worsteds and worsted blends.

Overseas Briefs

Buenos Aires: Argentina will sell all state-owned textile facilities to the Association of Cotton Cooperative Entities for $3,250,000 and will free textile machinery and equipment from import duties. . . . *Vienna:* News from this listening post just outside the Iron Curtain is that Russia plans 24 new textile mills in Siberia, which now has no textile industry. By 1965 these mills will be producing 1-billion meters of cloth per year. . . . *Tokyo:* Japanese textile machinery makers are planning a big push soon for American markets. . . . From January to April Japan imported $191.1-million worth of raw cotton, waste, and linters, and exported $140.5-million worth of cotton goods. In this 4-mo. period exports of cotton fabrics were 12% higher than in the same 1960 period, but exports of cotton yarn and secondary cotton goods slumped 34% and 15% respectively. . .

Seoul: Increases in the price of cotton and devaluation of South Korean currency have cut exports of cotton cloth from 2- to 0.8-million yards a month and plunged the textile industry into gloom. Also the new military government's austerity program has halved sale of woolen and man-made fiber textiles. . . . *Paris:* Most of France's man-made fiber output soon will be concentrated in one company—chemical giant Rhone-Poulenc. Recent absorption of Celtex, producer of rayon fiber and yarn, means that Rhone-Poulenc now controls some 90% of France's rayon fiber and yarn, a substantial share of its acrylics, and all its polyamides, polyesters, and acetates.

Company Earnings

Company	Period	Sales ($1,000's)	Change From Year Ago	Earnings ($1,000's)	Change From Year Ago
Indian Head Mills	Qu. to 6-3	$23,700	+37.0%	$937	+14.7%
Indian Head Mills	Hlf. to 6-3	43,400	+41.0%	1,579	+10.8%
Wyandotte Worsted	Qu. to 5-27	n.a.	n.a.	72	−51.7%
Wyandotte Worsted	Hlf. to 5-27	n.a.	n.a.	96	−50.0%
Allied Chemical	Qu. to 6-30	211,299	− 2.5%	16,181	− 6.9%
Allied Chemical	Hlf. to 6-30	379,859	− 5.2%	25,061	−18.8%
American Enka	Hlf. to 6-18	48,072	+ 5.7%	1,823	+166.9%
E. I. du Pont	Qu. to 6-30	563,000	+ 0.2%	98,600	− 5.1%
E. I. du Pont	Hlf. to 6-30	1,076,000	− 1.9%	183,500	− 7.4%
Maremount Corp.	Hlf. to 6-30	32,628	+110.4%	1,379	+53.0%
Monsanto	Qu. to 6-30	246,322	+ 5.1%	19,079	− 1.7%
Monsanto	Hlf. to 6-30	465,676	+ 1.1%	34,587	−10.6%
Warner & Swasey	Hlf. to 6-30	28,248	−11.7%	1,438	−25.2%

WASHINGTON OUTLOOK . . .

Textile manufacturers will fight Washington's proposal for voluntary, multilateral export-import limitations, even though the plan won support from representatives at the 16-nation conference in Geneva.

Details of the long-term plan proposed at Geneva remain to be worked out by a special group from the General Agreement on Tariffs & Trade (GATT). But generally, exporting countries would agree to a sliding-scale freeze on exports, with Hong Kong asked to accept a 30 to 35% cut from recent levels. Importing countries would agree to a relatively free market access within set limits. European countries would reduce or remove quotas and tariffs.

Textile men will fight the plan on Capitol Hill, where their influence is strong. They want the program broadened to include wool and synthetics. They also feel the quota levels under consideration are much too high. The whole issue will come to a head next year when the Reciprocal Trade Act comes up for renewal in Congress.

●

Congressmen from textile states are backing textile producers with calls for stricter quotas or stiffer tariffs. Testifying before a House Labor subcommittee in mid-July, they blamed low-priced imports for severe unemployment in the textile industry.

Witnesses testifying before the subcommittee represented Congressional districts in North and South Carolina, Maine, and Pennsylvania. State Department negotiations in Geneva, they said, will result in increased textile imports. Rep. Robert W. Hemphill (D.-S.C.), leading the fight, believes drastic action is necessary "to prevent a depression in the textile industry. . . ."

●

An 8% tax credit on purchase of machinery and equipment has won tentative approval of the House Ways & Means Committee. But a tax credit for investment in new or expanded plant has been killed.

Here's the way the plan will work if it becomes a law: A company would be permitted to deduct from its tax bill in a given year 8% of the money it spent that same year on new or second-hand equipment—but only up to 50% of its tax liability. The deductible limit on used-equipment purchases would be $50,000.

The plan is expected to cost the Treasury about $1.1-billion in lost revenue. So far, the committee has failed to tighten "loopholes"—expense accounts, withholding on dividends and interest, etc.—to the extent the Administration would like. If the Treasury loss exceeds $500-million over-all, President Kennedy will veto the bill. The major test will come in mid-August, when the committee finishes work on the measure. Best bet: No action until next year.

HIGH QUALITY

Attained through:
- Minimum of defects
- Perfect mixture of materials
- Uniform weaving action

Resulting in:
- Less supervision
- Easy personnel training
- Reduction in down time
- Practically no replacement parts
- High productivity
- Making it possible to operate at —

MINIMUM COST

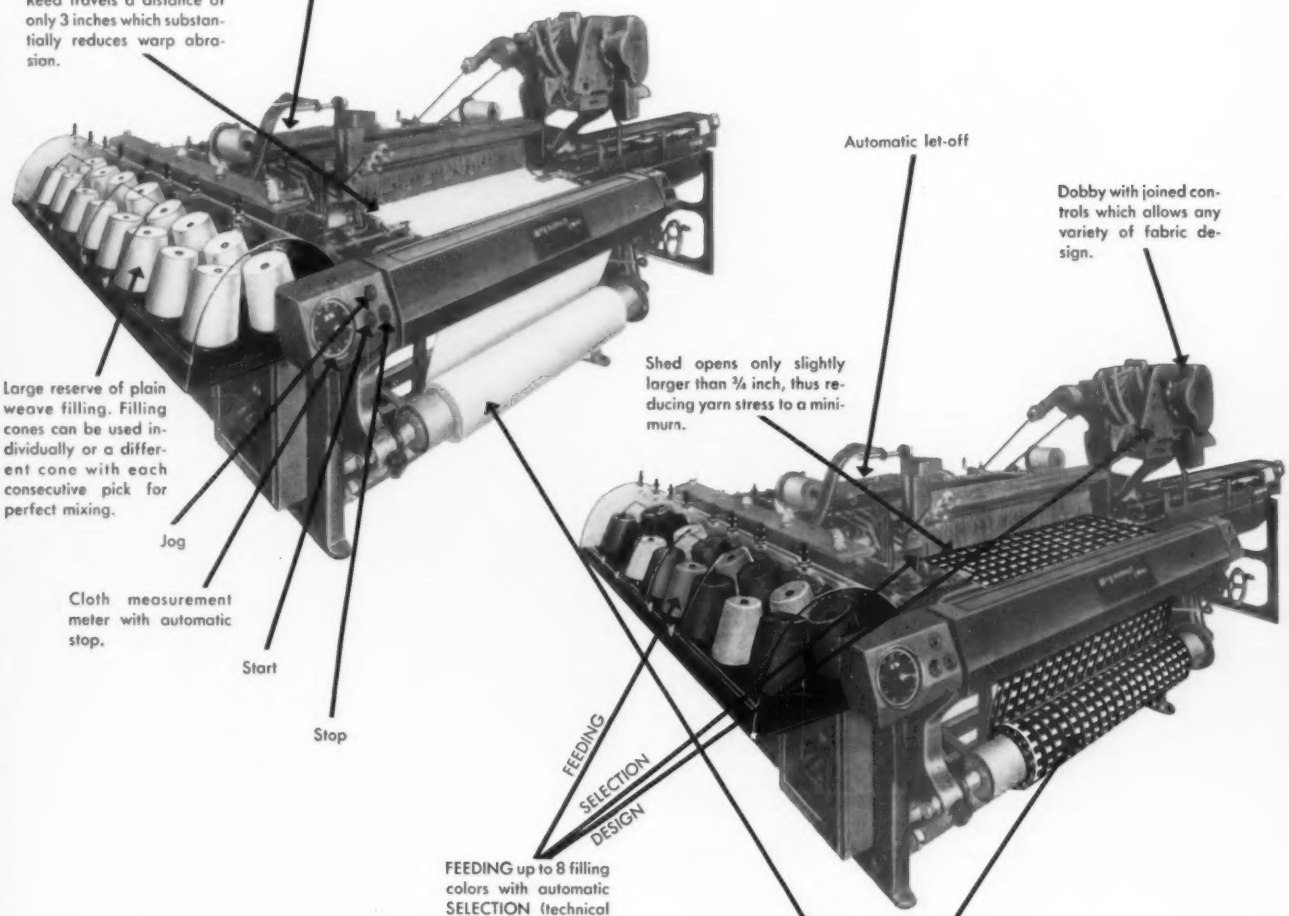
Fabrics can be woven:
- Using 8 filling colors or materials
- In any design
- From any material

This combination will permit a

GREATER PARTICIPATION IN THE MARKET

— and the Universal Iwer loom provides the three essential elements:

HIGH QUALITY + LOW COST + FLEXIBILITY


Constant warp tension
Reed travels a distance of only 3 inches which substantially reduces warp abrasion.
Automatic let-off
Dobby with joined controls which allows any variety of fabric design.
Shed opens only slightly larger than ¾ inch, thus reducing yarn stress to a minimum.
Large reserve of plain weave filling. Filling cones can be used individually or a different cone with each consecutive pick for perfect mixing.
Jog
Cloth measurement meter with automatic stop.
Start
Stop
FEEDING
SELECTION
DESIGN
FEEDING up to 8 filling colors with automatic SELECTION (technical Pic & Pic) predetermined by the DESIGN set-up in the special dobby head.

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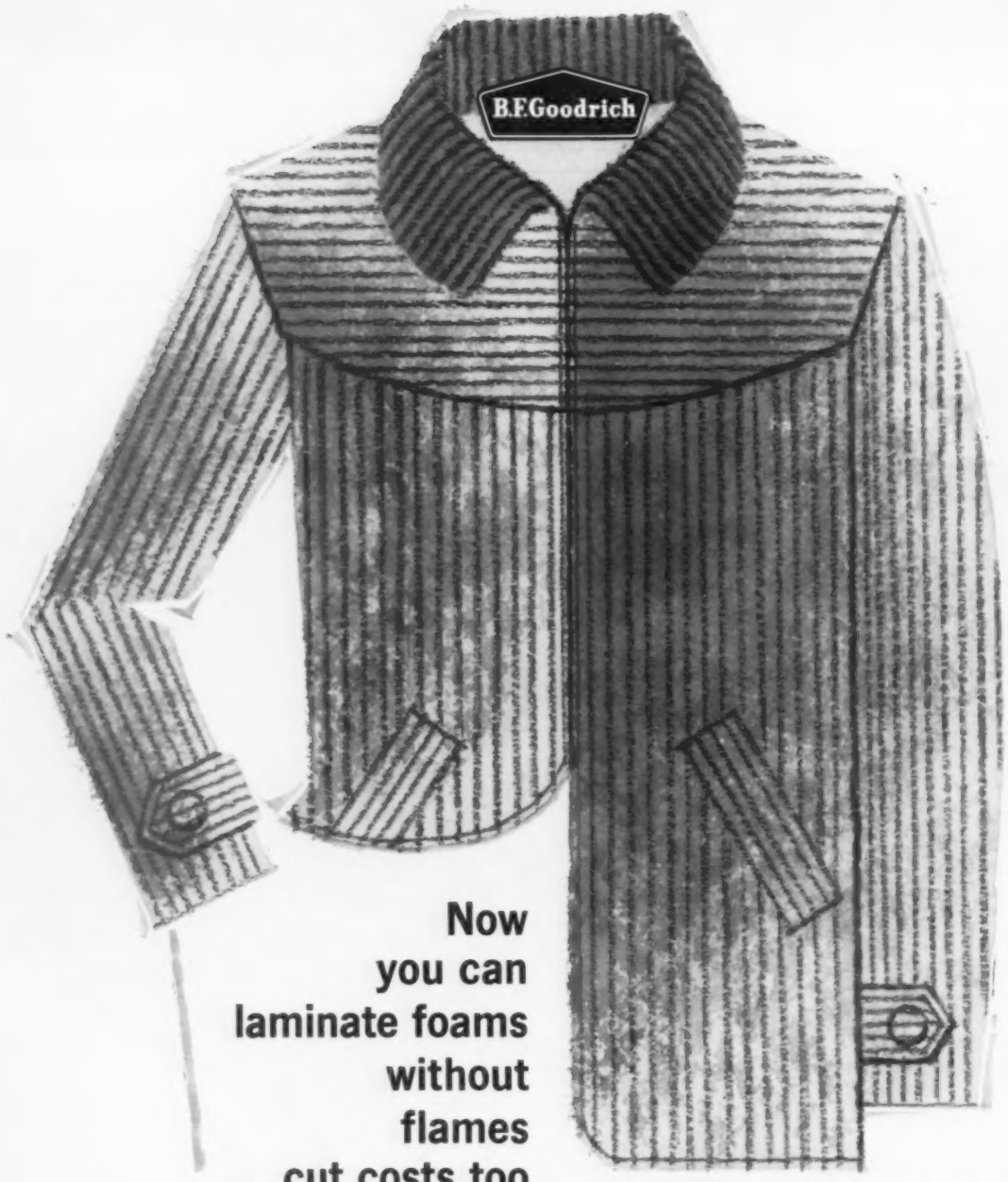

Now you can laminate foams without flames ...cut costs too

Any producer now using open-flame methods of laminating foam to fabric can cut costs with new Hycar 2671 reactive acrylic latex. This new latex makes possible adhesives without the problems of stiffness or discoloration that adhesives used to have. It eliminates the difficulties of the open-flame procedure—reduces handling problems and speeds up production.

The resulting bond is outstanding. Washability and resistance to solvents is excellent. Hycar 2671 is easy to use—much simpler than other binders. It is self-curing and stable. One of the largest licensers of foam materials has approved its use as an alternate to flame methods.

Hycar 2671 is also producing unusually effective back coatings for knit goods, upholstery and drapery fabrics. It's another sample of service you can get to produce better textiles for wider appeal. For more information, write Department PF-8, B.F.Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. In Canada: Kitchener, Ontario.

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B.F.Goodrich Chemical

a division of The B.F.Goodrich Company

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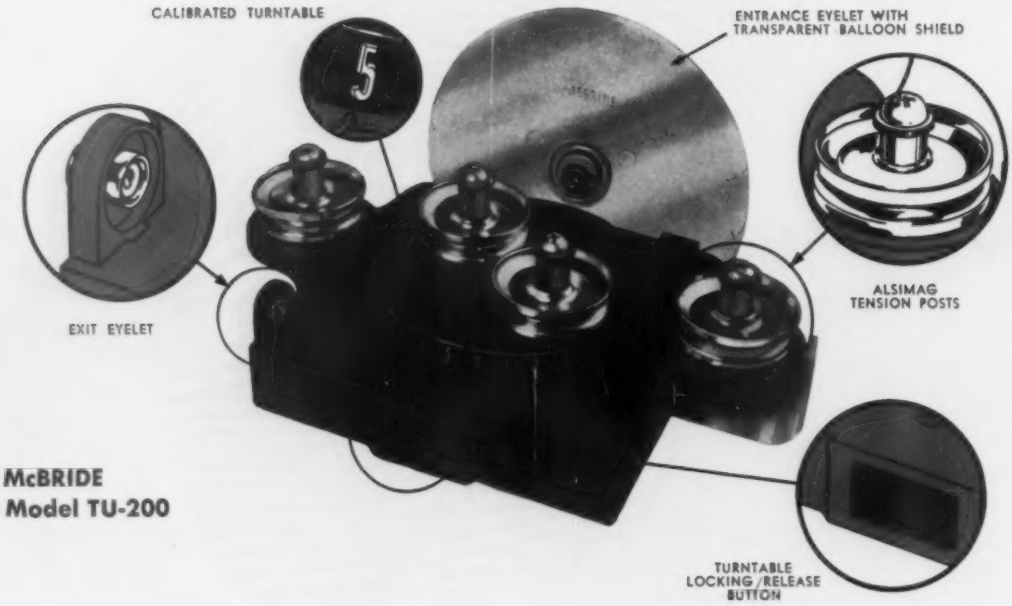
The McBRIDE 'Monitor'

CREEL TENSION DEVICE...



McBRIDE
Model TU-200

THE McBRIDE "MONITOR" creel tension is the ultimate in disc and post type tension devices. It combines maximum tension adjustment with rugged construction to give dependable results and trouble free operation.

The unit has two center tension posts mounted on a turntable which is calibrated into 8 selective positions and which may be adjusted thru a maximum range of 180°. By changing the turntable setting, 8 different angles of yarn wrap are obtainable, thus producing 8 different levels of output tension.

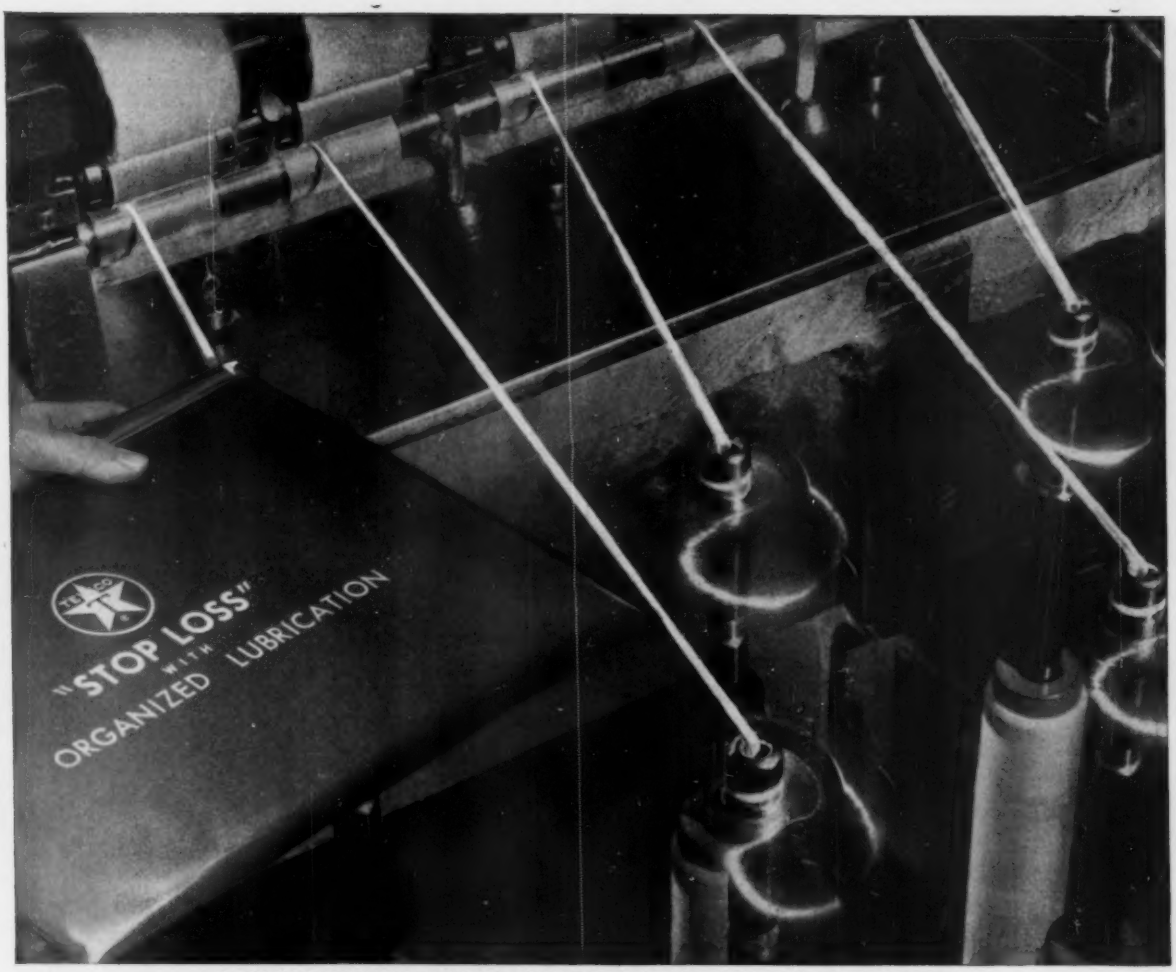
Provision has been made for the addition of one or two more tension posts by supplying two mounting positions just outside the periphery of the turntable and at 180° extremes.

Low magnitude tension adjustment is accomplished by pressing the release button located in the front center of the base. This frees the normally locked turntable which may then be rotated to obtain the desired amount of tension in the yarn. Substantial increase in tension may be obtained by the use of heavier tension discs, adding tension posts, or a combination of both.

Threading of the 'Monitor' tension is simplified by use of a transparent balloon shield at the entrance eyelet. Also, a black turntable gives better visual contrast and the finest of yarns show up more clearly to the operator.

The unit is available with two, three or four tension posts, and tension discs in weights and finishes to suit the application. For very heavy yarns, the device may be equipped with larger entrance and exit eyelets in alsimag, titanium or porcelain.

EDWARD J. McBRIDE CO., Inc. | COTTMAN AVENUE & WISSINOMING STREET
PHILADELPHIA 35, PENNSYLVANIA



TEXACO'S "STOP LOSS" PROGRAM quickly solves lubrication problems that spoil your profit.

Texaco's "Stop Loss" Program can help you stop profits from creeping away

Oil on the roving! Downtime piles up as you find and correct the trouble—and profits creep away.

Texaco's "Stop Loss" Program can help you eliminate losses due to oil soilage and other causes—*add as much as 4% to your net profit.* It's a completely flexible program and it works in large mills and small.

A "Stop Loss" Program begins with a study of your mill's lubrication requirements—from pickers to looms. This is followed-up with recommendations for a lubrication control system fitted to your mill's needs. Then Texaco provides the basic "tools" needed to make "Stop Loss" work for you.

"Stop Loss" can save money in your mill. See how—by sending for more information. And ask to see our new film, "Stop Loss with Organized Lubrication", which dramatically presents new opportunities for savings. Just mail the coupon below today.

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I'd like more information on Texaco's new program "Stop Loss with Organized Lubrication".

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J. D. Moore, Spinning Room Overseer of Muscogee Manufacturing Co., Columbus, Georgia, and John Bush, Armstrong representative, talk about cot performance. This frame is equipped with Accotex J-490 cots and NO-7876 aprons.

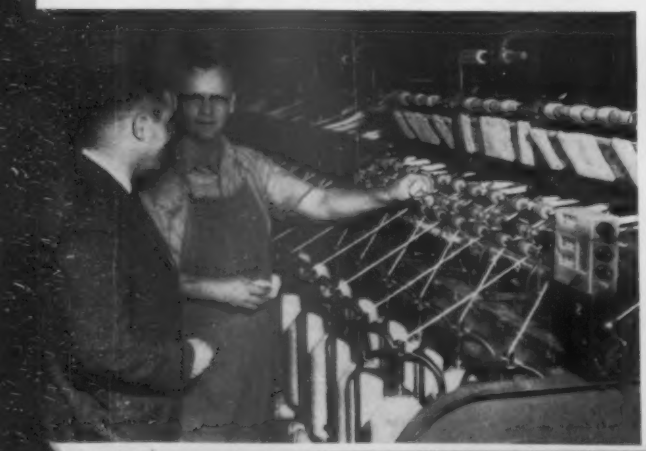
Combing . . . drawing . . . roving . . . spinning –on every frame, Accotex products help you turn out quality work

At every step in yarn preparation — from comber and drawing frame to spinning — Accotex roll coverings and aprons will help you build strength and uniformity into your production. That's true no matter what type of fiber or blend you're spinning, and no matter what type of equipment you're using.

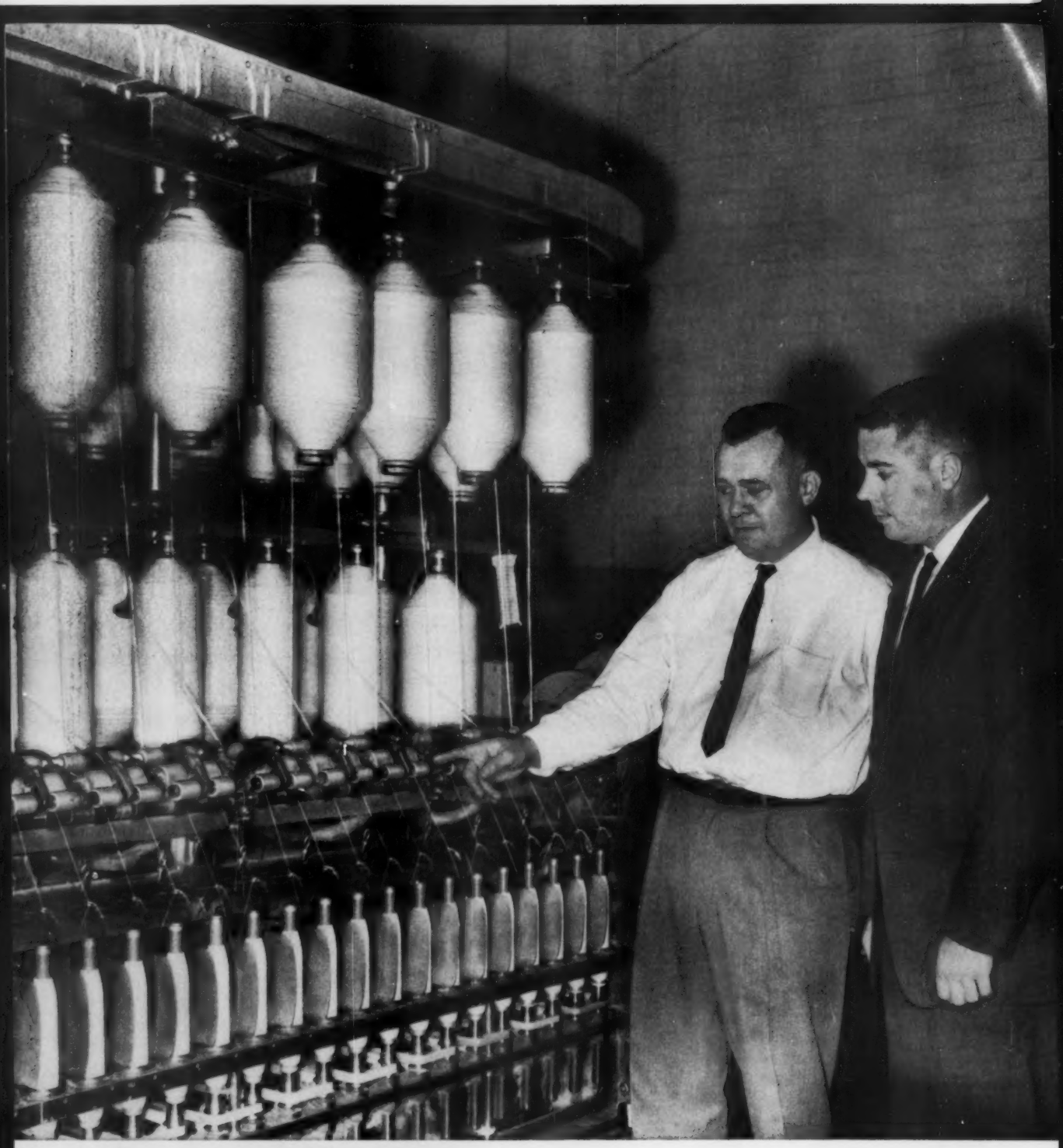
When you specify Accotex products, you also get the benefit of the specialized training and experience of your Armstrong man . . . a man who can make dependable suggestions when you have questions about the selection or performance of roll covers and aprons. Here, for example, you see Armstrong man John Bush working with personnel of the Muscogee Manufacturing Company.

Be sure to call *your* Armstrong man on any roll covering or apron problem. Armstrong Cork Company, Industrial Division, 6508 Dauphin Street, Lancaster, Pennsylvania. ACCOTEX® IS A TRADE-MARK OF ARMSTRONG CORK COMPANY

Bush chats with Joseph Griffin about the special electrolytes in the Accotex J-490 cots that minimize lapping. This frame also uses NO-7876 aprons.

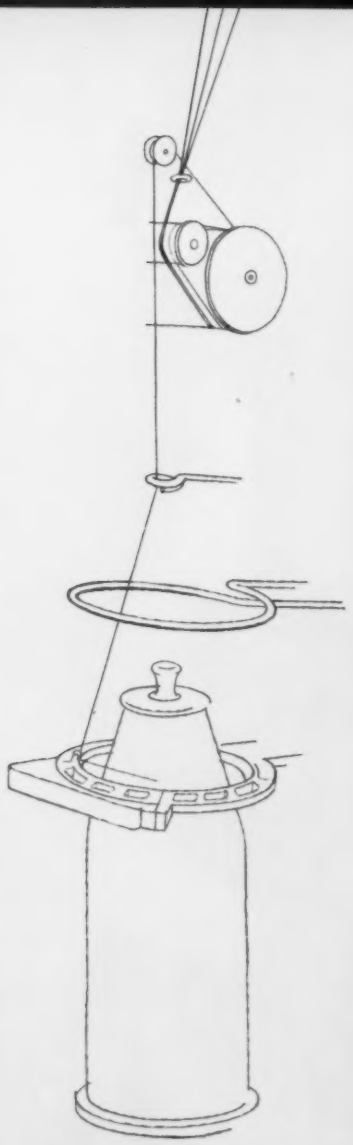


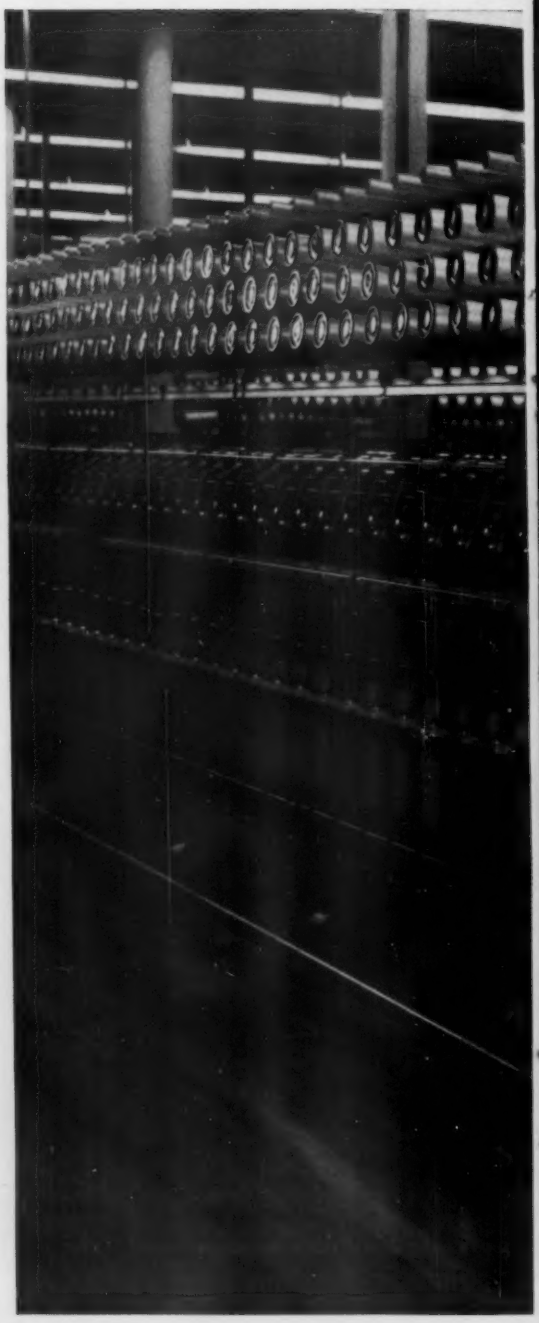
J. D. McCosh is Overseer of Carding at Muscogee. This drawing frame has Accotex J-490 cots and Accotex clearer materials.



Bush is shown in the roll shop with James Payton on the left and William Thomaston on the right. Payton is Asst. Foreman of Carding and Thomaston is Foreman of the Roll Shop.

Armstrong
ACCOTEX COTS AND APRONS
CIRCLE 29 ON READER SERVICE CARD





LARGE PACKAGE RING TWISTING

with the new Leesona Model No. 512

Larger packages are your key to larger savings — in ring twisting and subsequent operations. And no other ring twister has the operating advantages of Leesona Number 512 to help cut costs even further.

With a Number 512 you automatically reduce the expense of handling, doffing, waste — and get longer runs of higher quality, knot-free yarn.

You also get these major advances in Ring Twister design:

12-inch traverse and lightweight, counterbalanced ring rail to permit smoother ring rail motion for superior package formation at high speeds.

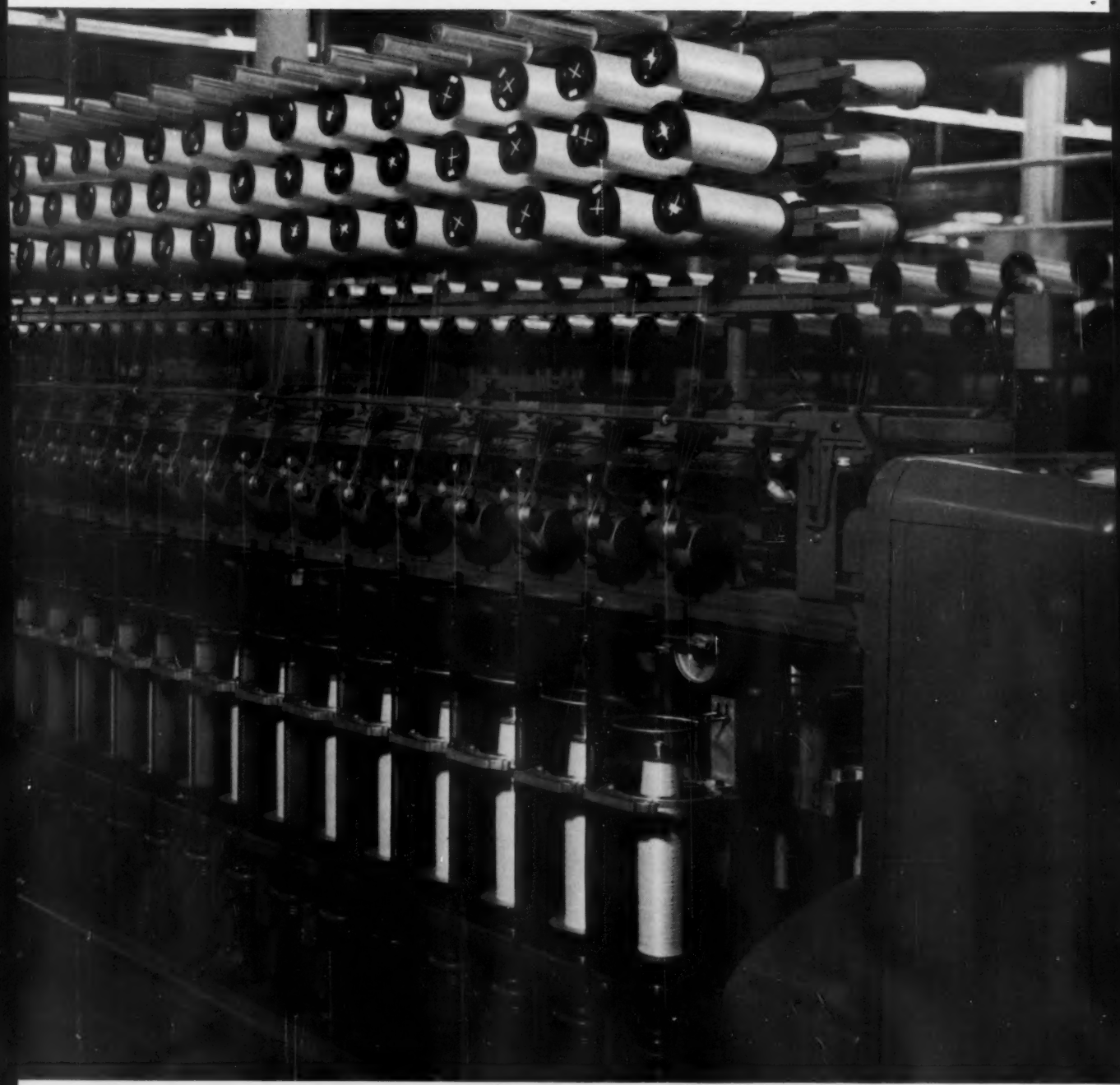
3 to 1 builder cam, producing a locking wind that delivers freely.

Improved heavy duty spindles center easily, accurately, permanently — and have minimum vibration.

Precision Spindle Drive with a wide, endless, lapless belt and large spindle whorl to insure high twist consistency.

Automatic stop motion to eliminate roll wrap or drop ply. Instantly stops feed roll and spindle if single-end break or run-out occurs.

Oilless bearings are used wherever possi-



23.1.40

ble to reduce maintenance. Lifter motion assembly and roller beam are also designed for protection from lint to further reduce downtime.

Removable 7-spindle separator units provide maximum cleaning efficiency.

Many other notable design features in the Number 512 will benefit your own production. For details, contact your nearest Leesona Sales Engineer — in Boston, Philadelphia, Charlotte, Atlanta or Los Angeles. Or write to LEESONA CORPORATION, P. O. Box 6088, Providence 4, R. I.

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Leesona leads...
to better fabrics

CIRCLE 31 ON READER SERVICE CARD

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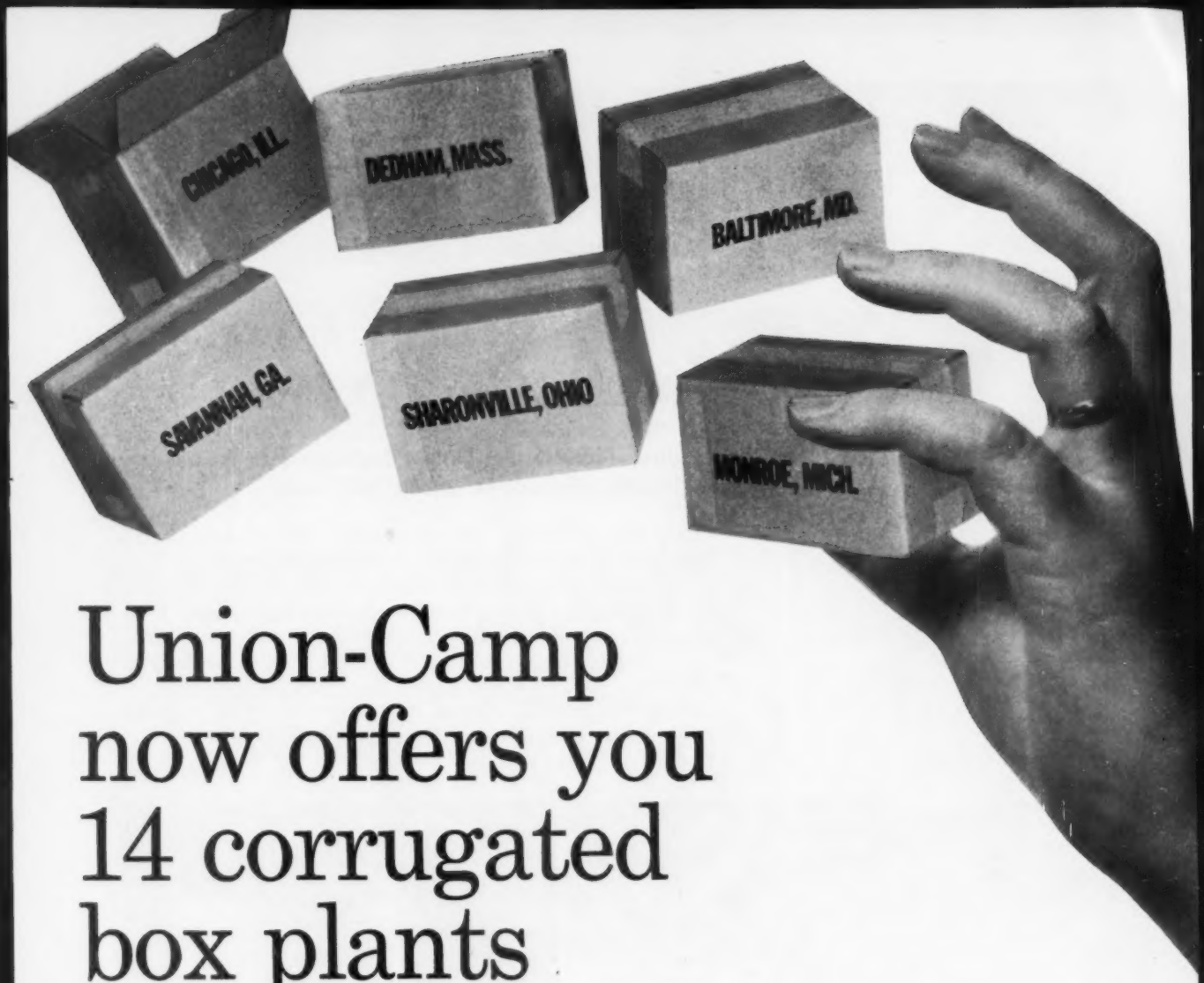
LAKELAND, FLA.
CLEVELAND, OHIO
SPARTANBURG, S.C.
JAMESTOWN, N.C.
EATON RAPIDS, MICH.
WASHINGTON, PA.



Union-Camp now offers you 14 corrugated box plants

Fast service is no gamble when you deal with Union-Camp. Fourteen corrugated box plants are strategically located to supply all your corrugated packaging needs. Customized local service is combined with a comprehensive packaging evaluation program designed to assist you in specifications analysis, structural design, box testing, materials handling and graphic design.

Important reasons why more and more companies are turning to Union-Camp for creative help in packaging.

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Chicago, Ill.; 4545 West Palmer
†Benton Harbor, Mich.; 11th St. & Britain Ave.
†Monroe, Mich.; 1109 East Elm Ave.
†Eaton Rapids, Mich.; P. O. Box 8
*Baltimore, Md.; Eastern Box Co.; Wagner's Point
Jamestown, N. C.; 3704 Point Pleasant Rd.
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Savannah, Georgia; P. O. Box 570
Lakeland, Florida; P. O. Box 454

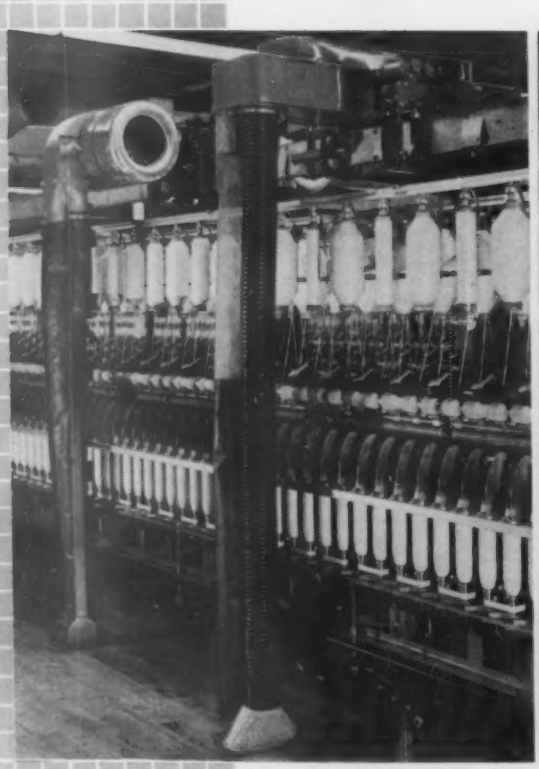
*Subsidiary Companies †River Raisin Division

For: Roving • Spinning • Twisting
Winding • Spooling • Weaving
And other textile machinery
***plus* specialized ceiling cleaning.**

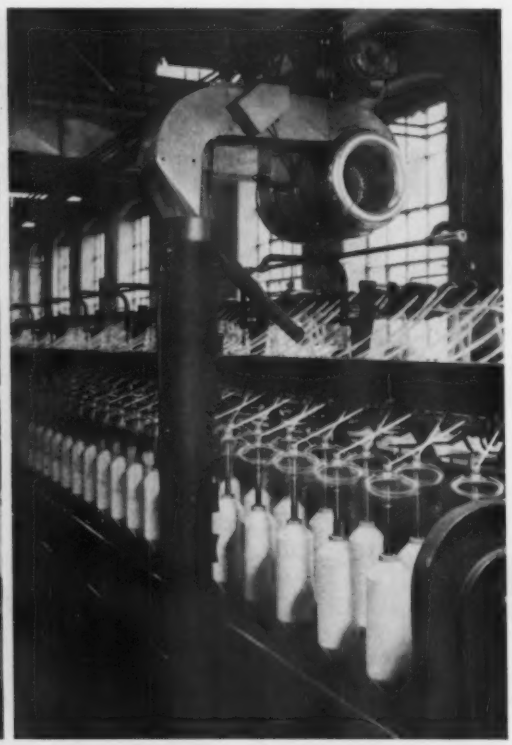
Bahnson TRAVELING CLEANERS

Have *Specialized Features* and *Custom Engineering* to provide maximum cleaning efficiency in specific mill areas

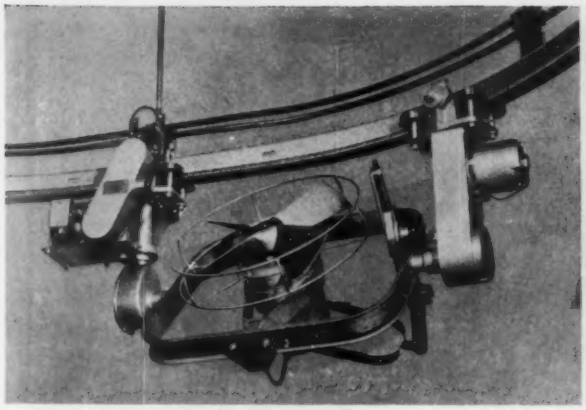
Bahnson's complete line of cleaners fits modern textile processing requirements. Individually designed to do a specialized job in the particular area where it is installed, each Bahnson Cleaner has proven efficiency in use. Each operates automatically to cut manual cleaning and improve production quality resulting in considerably reduced costs. Complete data on each cleaner is available in informative, illustrated bulletins. Write us for details on all Bahnson Cleaners or the individual cleaner of interest to you.



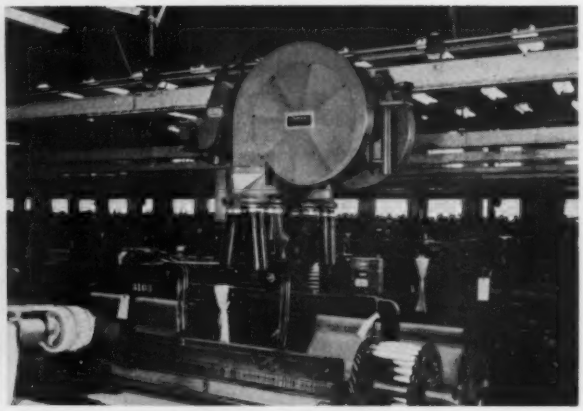
For Cleaner Floors:
Vacu-Pak Traveling Floor Sweeper
Write for Catalog 33-A



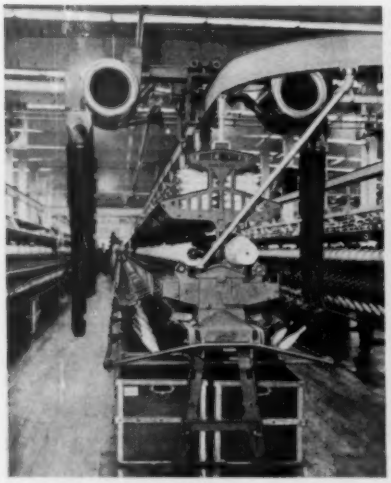
For Roving Frames:
Rov-Aire Traveling Cleaner
Write for Catalog 35-A



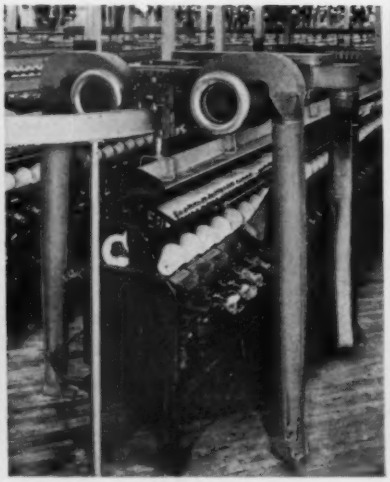
For Ceilings, Walls, Overhead Areas:
Aero-Sweep Traveling Cleaner
Write for Catalog 21-A



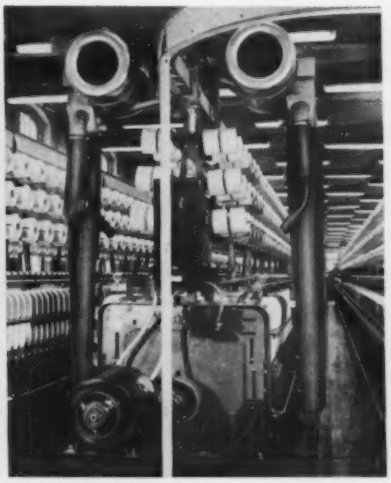
For Looms and Weave Rooms:
Duo-Blast Traveling Cleaner
Write for Catalog 37-A



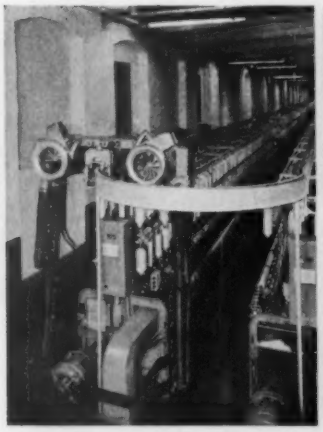
For Leesona Winders:
Cross-Jet Traveling Cleaner
Write for Catalog 32-A



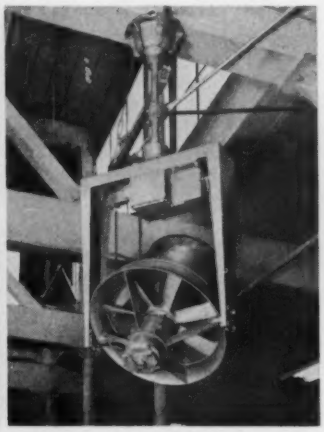
For Foster #102 Winders:
Cross-Jet Traveling Cleaner
and **Vacu-Pak** Floor Sweeper
Write for Catalogs 32-A and 33-A



For Twisting Frames:
Cross-Jet Traveling Cleaner
Write for Catalog 32-A



For Spinning Frames:
Cross-Jet Traveling Cleaner
Write for Catalog 32-A



For Fixed Overhead Cleaning:
Circulaire Overhead Cleaner
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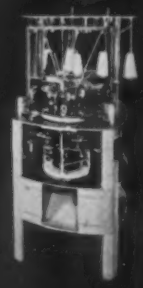
for inlays, circular suturing, overplaids, and high-fashion socks with the continental look

"READING" CK-B
for high production of plain dress and crew socks



"READING" CK-C
Universal men's and boys' sock machine

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Ladies' Seamless
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Where profits are highest and maintenance cost lowest — you'll find "READING" equipment. All of the machines and parts illustrated here are proved in service for profitable knitting results. Don't be satisfied with anything less than the best. Buy "READING"!

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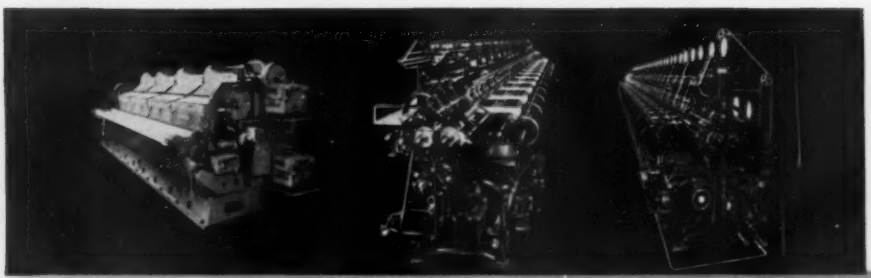


"READING" High-Speed Tricot Machine

"READING" Full-Fashioned Outerwear Machine

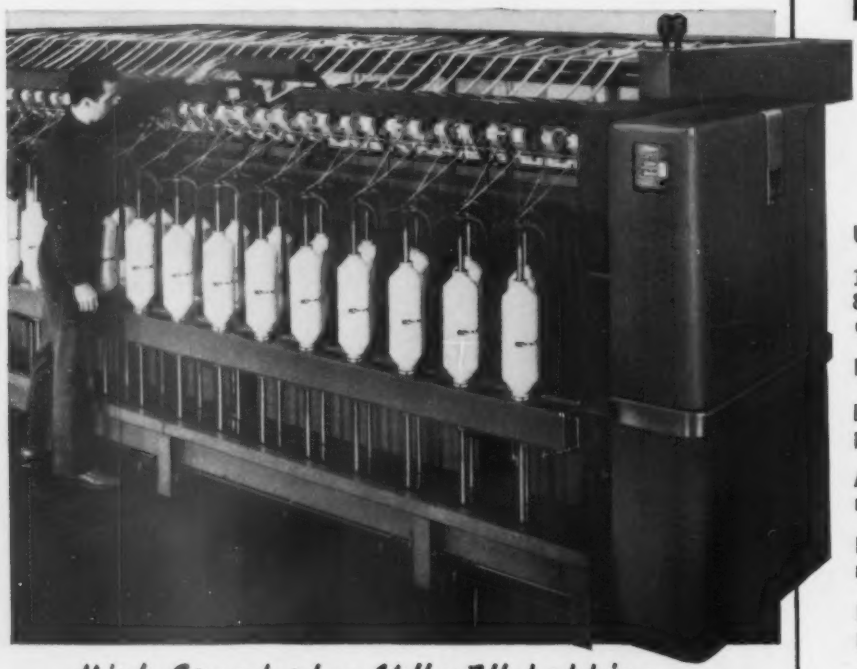
"READING 200" Full-Fashioned Hosiery Machine

TEXTILE MACHINE WORKS

Where engineering makes the difference

CIRCLE 37 ON READER SERVICE CARD

New WHITIN Model P SHATTERS Roving Production Records



the Model P offers:

- Up to 1200 rpm flyer speed
- 14" x 7" bobbins carrying 88-100 oz. net, depending on cotton and Hank Roving
- Full length 96 spindle frame
- Less floor space required per pound produced
- Antifriction top and bottom rolls — 3 lines
- Reduced doffing time on roving operation
- Improved and simplified gearing
- Doffs over a bale (500 lbs.) at a time
- Uniform-pressure spring weighting on rails
- Reduced creeling time on spinning
- Permanent mold, aluminum alloy flyers—easily threaded
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- Modern broken end and waste collection systems
- Variable speed pulley drive

High Speed-plus 14" x 7" bobbins make dramatic increases possible

Trapped in today's cost/price squeeze? Only two things will help — increase your production and cut operating costs — and the great new Whitin Model P Roving Frame does both for you.

The basis of its enormous output is its capacity to build giant 14" x 7" packages carrying 88 oz. or more at very high speeds to give you the production increases you've probably dreamed about, 20%, 30% — even 50% or more.

And these same giant packages also reduce both the frequency of doffing on the roving and of creeling on the spinning, resulting in significant savings in both places.

Just check the list of features, and we're sure you will want to discuss the Model P in more detail with your Whitin Sales Representative.

Why not call him today?

WHITIN MACHINE WORKS

WHITINSVILLE • MASSACHUSETTS

CHARLOTTE, N. C. GREENSBORO, N. C. ATLANTA, GA. SPARTANBURG, S. C.

The best way to better yarns

TEXTILE WORLD . . . Editorial Vol. 111, No. 8, August 1961

Needed Fast: 3 Decisions

EVERYWHERE you look these days in business and industry, you see symptoms of recovery from the 1960 business slump. What's more, if you can believe some pretty persuasive prophets, 1962 will be a banner year for the economy.

Some of this recovery is rubbing off on textiles. And if the boom comes as predicted, the textile industry is sure to feel some of its impact.

But we believe the textile industry deserves a better fate than just to have a little recovery rub off on it. That's a passive role that ill becomes a giant industry—and certainly not the role the industry's leaders seek. What they seek is opportunity for their industry to become a full partner in recovery. Though in many ways it is better off now than it was a year ago, it is not a full partner in recovery today—and will not be until and unless it can plan and act on its future with some assurance of a predictable operating base.

The textile industry needs this assurance promptly—and is entitled to it. This assurance can come only from clear decision on three matters that now lie with our government:

1. Decision on imports—The industry has submitted strong pleas for a rollback on imports. It has laid its case before the State Department and before the Office of Civil & Defense Mobilization (OCDM).

With laudable speed the State Department has laid the groundwork for negotiations with textile-producing and consuming nations and scheduled an international conference at Geneva. Meanwhile, OCDM has taken the industry's plea under study.

It is important that some results flow from one or the other of these agencies. (The Geneva conference had not yet convened when this page went to the printer.) But whatever the results are to be, it is equally important that they come quickly. The industry (and its friends in Washington) will be understandably intolerant if there is indecision, bickering, or delay at Geneva, or bureaucratic frustration in the OCDM. It needs to know unequivocally and immediately where it stands—needs to know whether it must operate with or without quotas—so it can get on with its job.

2. Decision on cotton subsidies—Our government cannot help the American textile industry by boosting textile wages overseas. But the United States government does fix the price of American cotton sold overseas, and thus has a role in determining the equities or inequities of cotton and cotton-textile trade between the United States and other countries. This is something our government can and must do something about.

We can see no valid reason for the Agriculture Department to delay any longer in coming to firm, clear decision on the cotton subsidy. The method by which today's cotton-price inequities are removed is not so important as the speed with which they are removed.

3. Decision on depreciation—Treasury Department studies of industrial-equipment depreciation have been going on for a long time. What's more, three months after President Kennedy's directive in May, Treasury still has not completed its study of the textile industry's special problems and still has made no recommendations. The time for action is now—not a month or a year from now.

The decision, when it comes, can go only one of two ways—either to change the depreciation rules or not to change them. It's as simple as that. But the dispatch with which Treasury comes to decision—be it to change the rules or not to change them—is almost as important as the way the decision turns.

Under today's rules, textile management men have about $500-million a year, mostly depreciation money, to spend for modernizing their plant and equipment. A tidy sum. But in the swift advance of textile technology today, $500-million is not enough.

We believe a relaxation of the depreciation rules would unleash an equipment- and plant-modernization program unequaled in the textile industry's history—a program that would benefit the industry, the economy, and the nation as a whole. The sooner the decision on such relaxation comes, the better for all concerned.

ONE TURBO DEMONSTRATION is worth a thousand words

Bring your fibers, your fabrics or your finished garments to Turbo – and see for yourself what Turbo Machines can do for you. A staff of experts will deal with your special problems.

Turbo Stapler

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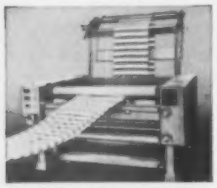
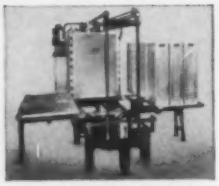
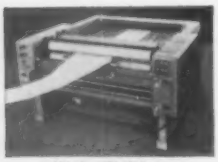


Turbo Padder-Extractor for Tubular Knits



Turbo FS-300 Fiber Setter



Turbo Finisher for Tubular Knits

Turbo Package Dyeing and Drying Machines

Turbo Tow Processing Machine

Turbo Electro-Finisher

For Hosiery:
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- PRE-BOARDING MACHINES
- BOARDING MACHINES

For Tubular Knit Fabrics
- FINISHER
- PADDER EXTRACTOR

For Pile Fabrics — Woolens — Wool Blends
- ELECTRO-FINISHER
- AUTOMATIC FRAMING MACHINE
- AUTO-FESTOONER
- SHEARER

For Synthetic Fiber Processing
- STAPLER
- FIBER SETTERS
- CRIMPING MACHINES
- TOW PROCESSING MACHINES

For Sweaters
- SWEATER SETTER
- ROTARY DYEING MACHINES

For Dyeing, and Drying
- EXTRACTOR-DRYER
- PACKAGE DYEING MACHINES
- SKEIN DYEING MACHINES
- ROTARY DYEING MACHINES

For Carpets
- CROSS-SHEARER
- FIBER SETTERS

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lower handling costs with...

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easy flow starch

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helpful data on these fine products for the Textile Industry:
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Warner & Swasey M-3700 Pin Drafter® gives these important benefits

HIGHER CAPACITY and PRODUCTIVITY

- Can feed in up to 50 oz. per 5 yds., delivering up to 12 oz. per 5 yds. at rate of 1500 faller drops per minute.

MAXIMUM FLEXIBILITY

- Produces blends of from 5% to 10% up to 80/20. Can blend natural/natural, synthetic/synthetic, natural/synthetic, dye house work blends, other combinations.
- Applicable to French, Bradford, American or Jute Systems, card room, dye house or any operation where a heavy-duty gill is required for uniformity and parallelization of sliver at increased production.

IMPROVED QUALITY

- Use of 5/16" pitch faller screw provides close fiber control for short staple fibers in a wool diagram.
- Nip roll can be moved in to within 13/16" or out 1 11/16" from fallers—provides flexibility and close nip control on fibers from 2" to 9".
- 3-roll draft system eliminates apron soft spots, unevenness, etc.
- Flat pinning prevents fiber build-up, provides easier drafting, helps eliminate hard ends and lowers pin maintenance.
- Delivers larger packages—up to 50 lbs., can or ball. Permits longer runs with fewer piecings.

GREATER VERSATILITY

- Adaptable to various attachments and deliveries ranging from 15" to 24" diameter can delivery, ball delivery of 12" to 18" length of ball up to 24" diameter, or fully automatic can and ball delivery.

TOTAL RESULTS—uniform weight and blend • better parallelization of fiber • reduced waste and noilage • improved efficiency • lower maintenance costs • built-in quality control on subsequent operations.

Warner & Swasey offers the most complete line of pin controlled drawing equipment available. Whatever your drawing requirements may be, a whole new field of *profitable operation* is opened up by the Warner & Swasey PIN DRAFTER® Intersecting Draw Frame.

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TEXTILE WORLD

Management Bulletin

Things you should know about . . .

The Slack in Bank Business Loans

You may be able to get an attractive deal today if you're in the market for a business loan. Some banks are easing terms in an effort to combat a continuing downturn in business loans despite the upswing in the nation's economy. One reason: Many companies are finding cheaper credit elsewhere. They are turning to short-term promissory notes (then selling longer-term securities and paying off their bank loans). Short-term notes run at 2½% and somewhat higher, while banks charge around 4%. However, banks are now more liberal about the types and maturities of loans they make. Some are relaxing credit. And almost all are calling on businessmen more often.

Labor-Turnover Costs

Hiring the wrong man for today's complex jobs can cost your company plenty—as much as $10,000. A recent survey estimates these replacement costs: a dictating machine operator, $700; an aircraft assembly worker, $1,000; a salesman, $6,684; and an engineer, $10,000. These figures take into consideration many camouflaged cost factors, i.e., high turnover rate lowers employee morale, decreases production, increases scrap ratio, damage to machinery, and accident rate. You'll find details in the Merchants & Manufacturers Assn. (L.A.) booklet "Labor Turnover: Causes, Costs, & Methods of Control."

Soviet Industrial Policy Changes

A new change in the Soviet Union's economic policy could affect world textile markets. According to Premier Khrushchev, Russians are putting new emphasis on consumer goods. Right now, they have limited capacity for producing textiles, clothing, and other consumer goods. Much of their equipment is obsolete. To effect the policy change, the Communists will have to invest big money in facilities. This may signal a stepped-up drive for more machinery from outside the Iron Curtain. Unless Russian production of cotton increases faster than it is now, the Soviets may have to buy more cotton abroad. On the other hand, they may expand further in the fast-growing man-made fiber field.

The Population Explosion

The population expansion projected for the future may not be a guarantee of growth in our economy. You'll find this other-side-of-the-coin thinking in "The Trojan Horse of Population Growth" (Harvard Business Review). The article challenges the assumption that increasing numbers of worker-consumers will create an ever-rising demand. It maintains that higher wages spurred spending in the past. And that a shortage of workers in the 1950's pushed wages up and spurred labor-saving equipment. It questions whether wages (and purchasing power) will stay high when the coming flood of workers hits the market.

FOAM LAMINATES . . . are catching on fast for many fabrics—knit dress goods (top) and outerwear, and woven suitings and sportswear, to mention four.

FOAM LAMINATES:
Today's Hottest Specialty

Foam-backed fabrics are moving up fast today, are pushing hard into the field of outerwear fabrics. Here's up-to-the-minute information on foams—how they're made, how to apply them, and what's happening in this new segment of the textile industry.

FASTEST growing development in textiles today? It's lamination of polyurethane foams to knitted and woven outerwear fabrics (photo).

Look at the growth figures: In 1959 foam-backed fabrics were just a novelty. In 1960 manufacturers laminated 15-million yards of knit goods to foam. In 1961 the figure will total over 90-million yards. And by 1965, says Manager Benjamin Collins, Plastics Div., Nopco Chemical Co., the figure will rise to 300-million yards.

Though the big push has been in knit goods, woven fabrics are moving fast in the laminates field. Laminators don't like to talk much about their processes or their volume. But it's a fair guess that they will foam-laminate at least 25-million yards of woven goods in 1961, and probably twice as much in 1962.

Dollars? There's at least one indication of the growing value of these new products: Sales of foams used for these newly designed fabrics came to $7-million in 1960, will top $40-million in 1961, and should top $75-million in 1962.

By ROBERT W. PINAULT
Associate Editor, TEXTILE WORLD

Fabrics: Scott Paper Co., Foam Div.

NO GIMMICK, THIS

The growing activity in foam laminates is no tinhorn, fly-by-night business. Far from it. The truth is, foam lamination adds several desirable qualities to fabrics, and adds them in a simple, low-cost operation. Take a quick rundown:

Insulation—Ounce for ounce, the foams in use today beat all natural and man-made fibers by 55 to 160% in insulating value. At the same time, they breathe.

Reliability—Today's foam-backed fabrics withstand washing and drycleaning. The foams resist almost all kinds of chemical attack, don't deform permanently under normal loads, are nonallergenic, and have no odor.

Adaptability—With foams, you can convert light dresswear materials into coatings and jacket fabrics.

Stability—Foam backing provides dimensional stability that is not inherent in some knitted fabrics. Wrinkle resistance, too.

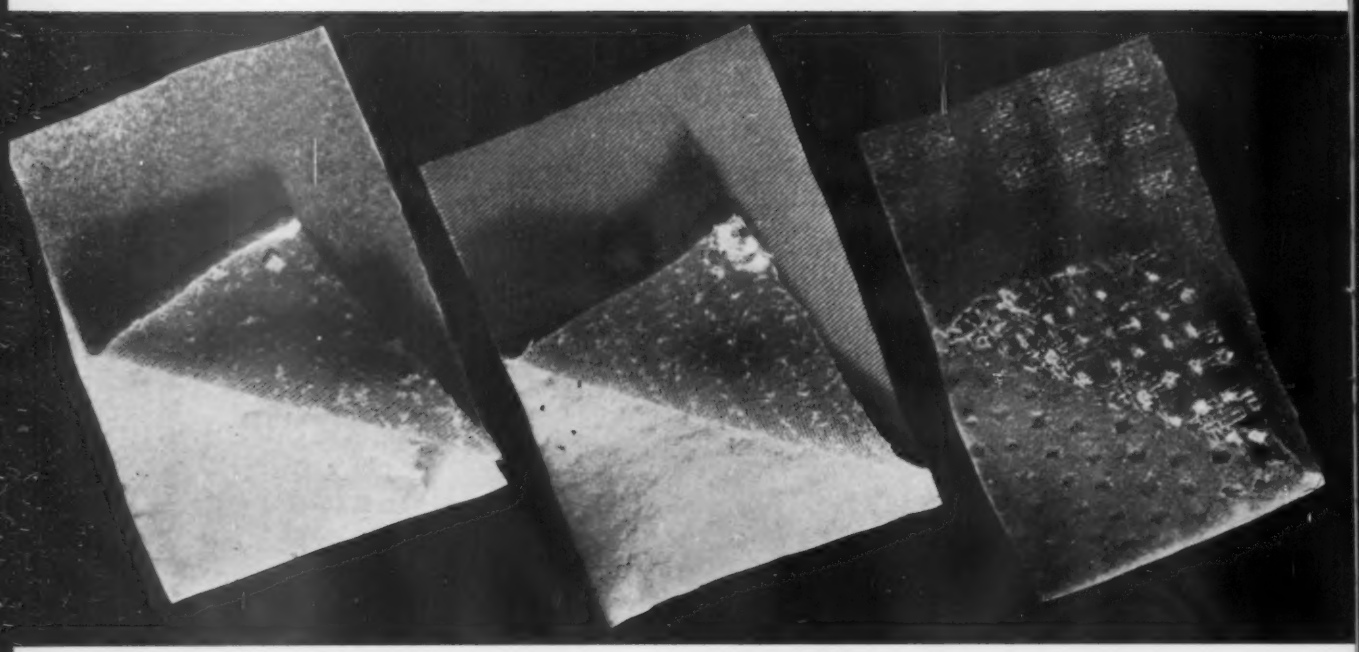
There were some failures with laminates early in the game. For example, the temptation to substitute foam for fabric was too much for some operators, and goods that were unsuited for advertised uses reached the market. And there were some other shortcomings, too—poor bonding, shrinkage after laundering, poor resistance to drycleaning, and the like.

But troubles and failures are rare today. Manufacturers now accept the fact that fabric construction, design, and finish, plus sound technology, are just as important to foam laminates as to any other class of goods.

WHERE FOAM COMES FROM

'Way back in 1848, the chemical reaction on which today's foams are based was discovered by Wurtz in Germany. He found that isocyanates and various alcohols combine to make urethanes. But his idea lay dormant until the early 1930's, when other chemists took it up and expanded the field enormously. Now, toluene diisocyanate and an endless variety of polyols, amines, acids, and amides are reacted to give polyurethane foams and coatings of widely varying characteristics and properties.

For foams destined for textile uses, the basic ingredient is toluene diisocyanate (TDI), which is reacted with polyester resins in the presence



BONDING methods show up when foam is peeled back, revealing irregular pattern of particles heat-bonded to fabric (left) and striped and dotted patterns reflecting adhesive bonding. Torn foam shows strength of bonds, thermal and adhesive.

FOAM LAMINATES . . . *Begins on page 44*

of water, amines, catalysts, and emulsifiers. All producers are licensed under agreement with Mobay (Monsanto-Bayer), which owns the basic patents.

There are 75 to 80 foam-producing ranges in the United States today. A range plus auxiliaries (tanks, mixing head, bun cutter) costs about $200,000, not including building structures. It's not a business for fly-by-nighters.

Foams already well established for apparel applications are Nopcofoam (Nopco Chemical Co.), Scottfoam (Scott Paper Co.), Curon (Reeves Bros., Inc.), and products of General Foam Corp., New York.

A relative newcomer in the apparel-foam field is Dayco Corp. Dayco has long experience in manufacturing rubber and plastic products for textiles. Until recently it had channeled its polyurethane-foam production primarily into furniture and packaging industries. Now, with its Waynesville (N. C.) plant and its American Latex Co. Div. in Los Angeles, Dayco is getting set for its share of the fabric-laminate business. The Waynesville plant can produce up to 200,000 pounds of foam per month for laminating. Both plants supply foam peeled to required thicknesses.

Marketing its polyester foams under the name of Daycofoam, Dayco also offers polyether foams, which are used more often in furniture cushions. Dayco people believe that polyether foams will find a good-sized outlet in apparel, in spite of their relatively poor resistance to drycleaning compared to polyester foams, and in spite of the fact that you can't heat-laminate them to fabrics. Big advantage is that polyether foams cost 15 to 20% less.

The five companies named supply 90% of the foam produced for textiles. Other foam producers rely heavily on furniture and industrial outlets for their sales. In fact, the furniture business was first to appreciate the value of polyether foams as cushioning materials. Polyether foams cost 40% less than foam rubber.

HOW FOAM IS MADE

If you forget the wide research that has gone into selecting and proportioning the ingredients in a polyester foam, production looks easy. Here's how it goes:

The toluene diisocyanate is fed in one stream to a mixing head. The polyester resins are also fed separately. Then water and an amine enter the mixing head through a separate hose. Catalysts and emulsifiers are usually mixed and added through a fourth hose. Because foreign matter in the mix may prevent foaming, all ingredients must be carefully filtered before they are pumped into the mixing head.

The head, turning at high speed, mixes the ingredients, then delivers the mixture through an oscillating nozzle onto a moving conveyor lined with silicone-treated paper. The paper peels off the foam readily after the foam leaves the range. Almost immediately upon hitting the conveyor, the mixture starts to rise.

Within 45 to 70 seconds it produces a continuous "bun" 22 to 24 inches high.

The bun moves through a well-ventilated range. Steam is played on the outer top surface to speed formation of a fully cured skin. Foam ranges are 200 to 400 feet long, and the bun is adequately cured by the time it has traveled the length of the range. Speed is 20 fpm.

The range terminates in an attachment that cuts off the buns in varying lengths to suit the end use. The coffin-like sections are usually 6 to 8 feet long. In this shape they are warehoused or shipped to foam converters, which peel the buns into the sheets used for textile lamination. A number of manufacturers supply peeled foam to laminators.

But the foam-manufacturing job isn't really as easy as it sounds. Meticulous care in proportioning the ingredients is important. And unless the polyester resins, catalysts, and emulsifiers are chemically uniform, undesirable characteristics will appear in the foams. Polyester foams cost 40 to 45¢ per pound in the types used for apparel.

SPECS—PRETTY TIGHT

Foams suitable for textile lamination demand fairly close tolerances—high-level quality control.

For instance, Nopco Chemical Co. checks out apparel laminating foams like this:

Resiliency—Measured by ball-drop test. Bounce should be 25 to 30% with a ⅝-in.-dia. steel ball dropped from an 18-in. height.

Density—Controlled to 1.5 pounds per cubic foot in one grade, 1.8 pounds per cubic foot in another grade.

Compression-load deflection—Averages 0.45 to 0.60 pound per square inch at 65% compression, 0.3 to 0.4 pound per square inch at 25% compression.

Compression set—Degree of permanent deformation after foam is subjected to 50% deflection for 22 hours at 158 F. A satisfactory foam will show 14% deflection.

Tear strength—Force required to tear a 1-in.-wide strip of foam.

Tensile strength — Considered good at 35 pounds per square inch.

Elongation—Should be 500 to 600%.

Cell count—About 40 cells per linear inch.

Other Nopco tests include flammability and accelerated aging.

THREE WAYS TO BOND

1. Bonding by heat—Probably 90% of polyester foam is applied to textiles by heat-fusing the foam to the fabric. Fusion comes from melting the surface of the foam (melting point 250 to 300 F.) with a gas flame and bringing foam and fabric together between two rollers. The still-tacky foam adheres to the cloth with excellent bond strength.

Important in heat laminating: absolute control of speed, heat, and feeding tensions of both the foam and the fabric.

Foam laminators guard the secrecy of their operations for at least three reasons. First, the heat-fusion process was patented by Curtiss-Wright Corp. The rights to this patent and the machinery involved are now owned by Reeves Bros., Inc. and are being licensed to some laminators. Other laminators are not sure of their patent position and therefore keep quiet about their process and equipment. Second, each laminator appears to think that he has made some improvement on the early machines that may protect him in a patent hassle. Third, he may have some improvement that boosts product quality. Whatever the reason, laminators are reluctant to show their machinery or discuss details of their operations.

The fusion process is simple, but fairly expensive. This is because about $\frac{1}{32}$ inch of foam is melted back to form the bond. Cost is about 11¢ per square yard. You have to buy $\frac{3}{32}$-in. foam to wind up with a $\frac{1}{16}$-in. lamination.

2. Bonding with adhesives—The rather high cost of heat bonding spurred adhesive manufacturers to develop materials that will form a good bond without impairing any of the desirable features of the end product. The adhesive must also be resistant to drycleaning solvents and unaffected by common laundering.

Up to now adhesive lamination has been used mainly on woven fabrics. But adhesive manufacturers will tell you that the day is not far off when adhesives will overtake the heat-fusion process. Reason is, of course, the lower cost of the adhesive bonding method. Adhesives are applied by spraying, by kiss-roll coating, or by rotogravure rolls.

The rotogravure rolls are engraved so that adhesive is applied in printed dots or stripes—a method now much in vogue among adhesive users. Advantages of these printed-adhesives patterns: They improve breathability, cost less for adhesive, have less effect on the hand of the goods, and provide excellent bonds. In fact, the foam will usually tear before the fabric-foam bond breaks.

. . . Turn the page

How One Foam Maker Prices His Polyester Foam

	WIDTH			
	42-in.	46-in.	54-in.	60-in.
THICKNESS	CENTS PER LINEAR YARD			
1/16-in.	23.5	25.5	30.0	33.5
5/64-in.	27.0	29.5	34.5	38.0
3/32-in.	30.5	33.5	39.0	43.5
1/8-in.	39.5	43.5	51.0	56.5
5/32-in.	47.5	52.0	61.0	68.0
3/16-in.	58.5	64.0	75.0	83.5
1/4-in.	75.0	82.5	97.0	108.0
3/8-in.	109.5	120.0	140.5	156.0

FOAM exits from range at Nopco Chemical Co. It has been cured in oven (rear). Oven hides nozzle, mixing head, tanks.

SPLIT BUN is bored through center to receive arbor of peeling machine. Template (right) shows diameter of log.

SEALER electrically butt-welds pieces together to make a roll of about 450 yards for shipping to laminators.

KNIT fabric enters tenter after saturation in water repellent. Goods must be flat when they go into clips.

FOAM LAMINATES . . . *Begins on page 44*

But there are many defenders of the continuous-film (spraying, kiss-roll coating) systems of applying the adhesive.

Either way, the mechanics of adhesive lamination have to be worked out with regard to the delicate structure of the foam. Once the adhesive has been applied to the foam, the fabric and foam must be joined between squeeze rolls under very light pressure. Here you have to avoid driving the adhesive into the foam, yet get enough pressure to make the bond. The ideal result comes from a combination of proper feed, adequate pressure, and an adhesive with quick tack and sufficient body.

The adhesive is deposited either as a film or a discontinuous pattern about 2 mils thick. Current products may require some heat to cure the adhesive or may be self-curing.

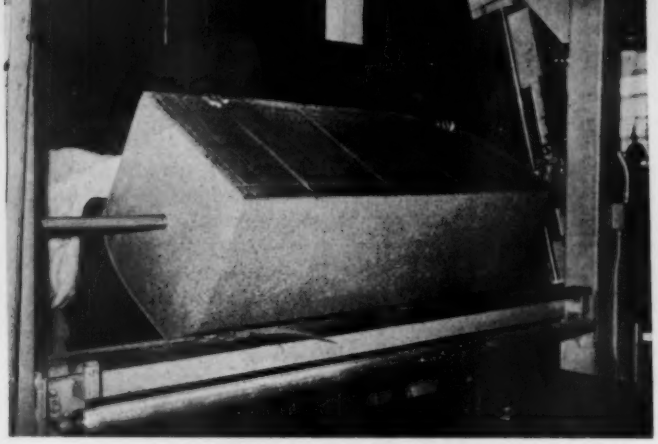
Chemically, the adhesives are resins or latices, but their composition is a closely held secret.

Right now, adhesives are available that work from solvent or aqueous solutions. Laminators like a high-solids material, preferably water-based (for low cost) and with a working-solution viscosity of 2,500 to 3,500 centipoises.

Several manufacturers supply suitable adhesives. National Starch & Chemical Co. promotes its Resyn 76-4788, described as a synthetic rubber cement. Manufacturer's Chemical Co. offers a nonflammable emulsion called Maniflex 789. Polymer Industries is completing plant trials with a new adhesive designed expressly for fabric lamination. Nopco Chemical Co. is also in this field. Thiokol Chemical Corp. (Trenton, N. J.) has just announced its solvent-based adhesive Unithane Adhesive 200. Undoubtedly others will enter this market.

3. Bonding by quilting—In this bonding operation, the foam, backed by a light scrim, is sewed to the outer-shell fabric in characteristic stitching. Quilted outerwear usually is designed for severe cold weather and is bulkier than fabrics to which foam is laminated.

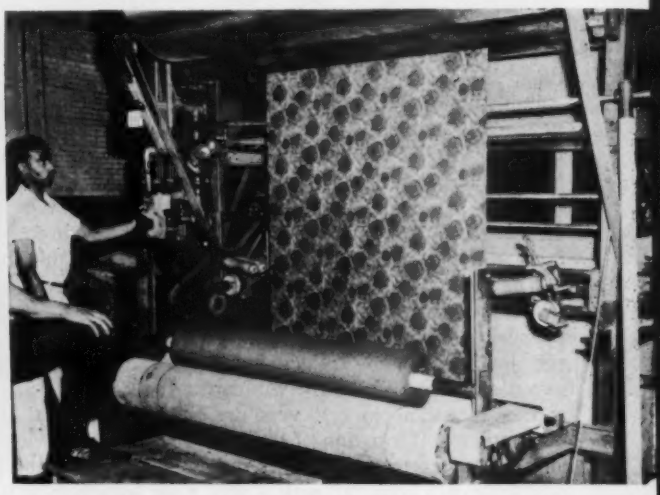
Checking the bond—Usually, tests are made on laminates still wet



BUN CORNERS will be cut off by a band saw that runs in a horizontal plane. Log must be round before peeling starts.

ROUNDED LOG of foam is ready for peeling to $\frac{3}{32}$-in. thickness. About 150 yards is maximum from one log.

CURER, hooked up with pad and tenter, provides time for curing silicone-type water repellent.



FINISHED goods are batched at the end of Polydynamic's range, ready for inspection and shipping.

from laboratory-type laundering or drycleaning. A 1-in.-wide strip, properly bonded, should require a 14- to 16-oz. pull in a standard Scott tester to separate the layers. Usually, the foam will tear before the bond is broken.

This strong bond, plus a low bonding cost of 3 to 6¢ per square yard (heat fusion costs 11¢) endows adhesion bonding with great potential for utilization.

HOW FOAMS DIFFER

Polyester foams suitable for lamination to textiles are pretty much alike chemically. But there are variations in physical characteristics of foam products that are made by the different manufacturers.

While it is true that chemistry of the foam can substantially affect the end result, the clearest difference probably comes from aftertreatment. For example, one major manufacturer etches out the membranes that span the surface of the cells. He does this by saponifying these membranes and dissolving them away by treating the peeled foam with caustic soda. Result is a characteristic skin-like surface coupled with increased breathability. Other producers are achieving similar effects.

Density of apparel foams varies between 1.5 and 1.89 pounds per cubic foot. But this criterion is not solely responsible for strength, drape, resilience, and general performance. Much depends on original formulation and aftertreatment, if any, given the foam.

HOW ABOUT FOAM COSTS?

The price of peeled foam ready for the laminator seems high when compared with the cost of the materials that go into polyurethane foams. Several reasons why:

- A foam-producing range with its resin-manufacturing facilities, tankage, mixing head, and auxiliary equipment is expensive. One producer values his entire setup, including housing for the manufacturing process, at $400,000.
- Waste adds to the cost. Buns pro-

duced on today's equipment look like a long, giant loaf of bread. They are generally split down the middle lengthwise to form two nearly square sections. When you mount one of these sections to peel off the foam, the corners are knocked off and the skin on top of the bun is also lost. You wind up with about 30% waste, salable only as such and at about one-fourth of what it cost to produce it.

A good bit of waste can be reconstituted and used for furniture padding. Foam manufacturers shred the waste, mix it with an adhesive, and mold it into blocks, then slit the blocks into wanted thicknesses to make excellent padding. Reconstituted foam is unsuitable for garment uses—too uneven in texture. Some waste is shredded and is used to stuff doll bodies, low-cost pillows, and so on. But these make-do's still fall far short of the market value of foam in sheet form.

The foam industry hasn't yet found a way to produce the bun in cylindrical form continuously. If you load the foam-producing mix into a cylinder by a batch, you can expect variations in cell structure. So continuous formation of the bun appears necessary. Engineers undoubtedly will come up with a way to make a cylindrical bun.

• Another factor in foam cost is transportation. The stuff is so light that a full freight car carries an l.c.l. tab. A 900-mile trip works out to about 1¢ per yard of 54x3/32-in. foam.

To get around transportation costs, one company is experimenting with compressing the buns to one-fourth normal size. Right now the idea looks pretty good, but the chemists worry about spontaneous combustion.

Some people in the business argue that if you're a laminator, you'd probably be better off, as far as shipping costs are concerned, to be located not over 250 miles from the source of your foam. But you can bend this rule if your laminating plant is close to markets for laminated fabrics. For example, Reeves Bros. makes its foam at Cornelia, N. C., and laminates in Garfield, N. J. (600 miles away but close to converters in New York City), Dalton, Ga. (300 miles away but the heart of the tufting industry), and Los Angeles (over 2,500 miles away but a center for tufting). Similarly, Nopco makes foam in North Arlington, N. J., close to laminators in New York, and Chattanooga, close to Dalton.

Granted, if you laminate foam to fabric, you'll come up with a higher cost per yard of goods. But there are gains that offset the added cost. For instance, you can make a warm, light outer garment from a piece of goods, knitted or woven, that by itself would be too light or open for outerwear use. Often you can switch from closely woven fabrics to lighter knitted goods at 25 to 35% less cost per yard. And you don't need a separate interlining for cold-weather togs.

Case in point: A sportswear manufacturer has a line for which he pays an average of $2.20 per yard for his woven outer-shell fabric. On top of this, he must buy interlining material and linings. He switches to a double-knit jersey fabric at $1 per yard, adds foam and water-repellent for another 75 to 80¢ per yard. Shell and interliner now cost him less than the $2.20 he previously paid for shell fabric alone, and he can shut down the interliner cutting line. *Result:* a garment that sells at $12.95 instead of $14.95—and performs as well as his previous offering.

Most laminating today is done on a custom basis by plants that specialize in this field.

Take Polydynamics Corp., Fairlawn, N. J. This firm is a division of Allied Polymer Corp., East Paterson, N. J. Polydynamics bought the old Fairlawn Finishing building and some of its equipment. To keep foam quality up to its high standards, Polydynamics does its own peeling at Fairlawn. At present it laminates in East Paterson. Another heat-fusion unit is about ready to go into operation at Fairlawn.

To complete the job for the converter, Polydynamics applies Dow-Corning's Syl-mer water-repellent finish on its modern pad-tenter-curer range. (A great deal of outerwear is given a water-repellent finish. But silicone-based products must be applied after the foam is laminated to the goods. Silicones are excellent release agents and interfere with bonding if they are present before lamination.) This two-step finishing process puts Polydynamics in a good position as a custom finisher.

A number of other concerns in and near the metropolitan area of New York are set up to laminate foam to fabric.

FUTURE FOR FOAM?

Over-all, the outlook is good. Foam has many advantages in textile applications. But the future for the small custom laminator may not be quite as bright as for the big laminator or the company that integrates laminating into its fabric production processes. Why? Because the custom laminator faces two problems—time and costs. They come up when an operation has to be performed on finished fabric in a plant that is remote from the source of the finished goods.

Already the vertical textile organizations are showing interest in this idea. At least one has reached the commercial production stage in laminating foam to fabric. These firms look at lamination as a continuation of the finishing process. Here's why:

Equipment costs for lamination are relatively modest. There are no time losses or extra freight charges if laminating is done at the finishing plant. Thus the integrated manufacturer can offer a complete package deal that will save money for the converter while the finishing plant racks up a profit for the laminating operation.

As examples, Newport Finishing Co. (Fall River, Mass.), Kenyon Piece Dye Works (Kenyon, R. I.), and A. D. Gosman (Lawrence, Mass), are licensed to laminate Deering-Milliken's Milium PLUS—a foam to which aluminum particles are applied to its free surface. Aluminum gives some additional heat-reflective qualities to the foam interlining.

Regardless of who does the job, foam-backed fabrics are blasting off into orbit right now. They could easily rival in growth and importance the established wash-and-wear finishes for lighter goods.

This Table Makes Tricot Analysis Easy

Pounds per Rack per 100-inches of Total Runners

Denier ▶	15	20	30	40	45	50	55	70	75	100	120	150
Width ▼	28 GAGE											
168 In.	0.0439	0.0585	0.0878	0.1171	0.1317	0.1463	0.1610	0.2049	0.2195	0.2927	0.3512	0.4390
147	0.0384	0.0512	0.0768	0.1025	0.1153	0.1281	0.1409	0.1793	0.1921	0.2561	0.3074	0.3841
126	0.0329	0.0439	0.0659	0.0878	0.0988	0.1098	0.1207	0.1537	0.1646	0.2195	0.2634	0.3293
	32 GAGE											
168	0.0502	0.0669	0.1003	0.1338	0.1505	0.1672	0.1840	0.2341	0.2509	0.3345		
147	0.0439	0.0585	0.0878	0.1171	0.1317	0.1463	0.1610	0.2049	0.2195	0.2927		
126	0.0376	0.0502	0.0753	0.1003	0.1129	0.1254	0.1380	0.1756	0.1881	0.2509		
	36 GAGE											
168	0.0564	0.0753	0.1129	0.1505	0.1693	0.1882	0.2070					
147	0.0494	0.0659	0.0988	0.1317	0.1482	0.1646	0.1811					
126	0.0423	0.0563	0.0847	0.1129	0.1270	0.1411	0.1552					

Newest Way to ANALYZE TRICOT

BUYERS of tricot are now swinging to a new way of checking tricot runner lengths. They're measuring the number of courses and wales in the dyed and finished fabric.

This measurement of courses is the true measurement of tricot length. It reflects the yardage yield that you can obtain from a specific combination of runner lengths and knitted width.

Today there are two important methods of analyzing tricot:

• **Method 1.** This is described in "Six Steps to Better Tricot Analysis" (TEXTILE WORLD, July 1960, p. 148).

• **Method 2.** This method is becoming increasingly important today. It's the one described below—and made easy in the table above. It deals with the check of rack weights, which are translated into piece weights. (This information is needed also to calculate gray-goods cost on any combination of runner lengths.)

Rack weight is based on four factors: (1) warp width, (2) gage, (3) combined top and bottom runner lengths, and (4) denier or deniers used. Rack weight multiplied by racks per piece gives piece weight of the gray cloth.

By CHARLES A. HAYES, Quality Control Engineer, Lee Dyeing Co. of Johnstown, Inc., Johnstown, N. Y.; and THOMAS H. JOHNSON, Textile Consultant, Schenectady.

THE EASY WAY

You can use a mathematical formula to find the rack weight that you need for control and for cost analysis. But the table makes the figuring easy. It eliminates the need for some of the mathematical calculations. The values in the table are calculated on true denier under standard atmospheric conditions.

If you use the table, you have to allow for yarn tare. Nylon, for example, contains about 1% extractable matter. In addition, the lubricant or other finish averages around 1%. Thus you must increase the rack- or piece-weight value by 2%. If you add more oil at warping, you must include this weight also.

Knowledge of your proper rack and piece weights will not only help you control costs—it will also give you greater knitting control. When all pieces in a warp are cut at the same rackage, your piece weights will be uniform.

Tolerance a hazard—You'll have to determine your own tolerance. One mill produces pieces that vary less than 0.5%. In another mill, pieces have a range of ±3%. If your rackages are correct, variations like these are a result of inadequate runner controls.

Take two examples:

Example 1—147 inches wide; 40-den. nylon; 70-in. top runner; 55-in. bottom runner; 28 gage; 350 racks.

0.1025 from table = pounds per rack per 100 inches of runners.

1.25 = (70-in. top runner + 55-in. bottom runner) ÷ 100 inches.

2% (1.02) = tare allowance.

$0.1025 \times 1.25 \times 1.02 = 0.1307$ pounds per rack.

0.1307×350 racks $= 45.7$ pounds per piece.

Example 2—168 inches wide; 70-den. nylon, 72-in. top runner; 15-den. nylon; 48-in. bottom runner; 28 gage; 300 racks.

Figure each denier separately. Also obtain percentage of each.

0.2049 from table = pounds per rack per 100 inches of runners.

$$0.72 = \frac{\text{72-in. top runner}}{\text{100 inches}}$$

0.0439 from table = pounds per rack per 100 inches.

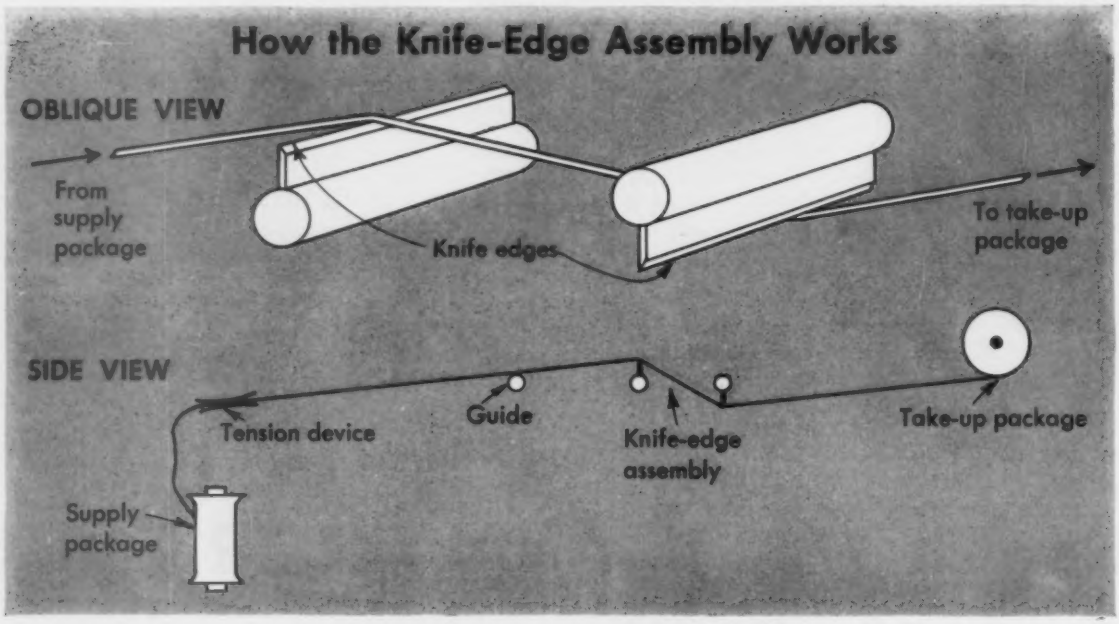
$$0.48 = \frac{\text{48-in. bottom runner}}{\text{100 inches}}$$

$0.2049 \times 0.72 \times 1.02 = 0.1505$ pounds per rack for top runner (87.5% of total weight).

$0.0439 \times 0.48 \times 1.02 = 0.0215$ pounds per rack for bottom runner (12.5% of total weight).

$0.1505 + 0.0215 = 0.1720 \times 300$ racks $= 51.60$ pounds per piece.

If you use an odd width such as 165 inches, find table value for 168 inches and interpolate.



YOU CAN STRESS yarn on its way from the supply package to the take-up package by passing it over and under the two opposing knife blades, shown in this schematic. Then, rewinding the yarn at low tension, you'll get a soft knitting cone.

This Simple Assembly Puts Bulk

If you're looking for a low-cost way to restore high bulk and soft hand to package-dyed Orlon, take a look at this new, easy method of stress bulking. The key: a simple tension unit.

UP TO NOW, the big problem for yarn dyers has been the high cost of restoring high bulk and soft hand to package-dyed Orlon fibers.

Today, no problem. Reason: a new, easy-to-use, low-cost method of stress bulking.

When you package-dye Orlon, the yarns on the inside of the package become flattened and oval in cross section. This distortion, caused by compressive shrinkage, reduces yarn bulk and makes the hand harsher. To eliminate this distortion most textile men have turned to skein dyeing. But skein dyeing costs more, and the same problem can develop —although it is not common. (Overloading the skein-dyeing machine or wet-winding yarns under high tension will flatten the yarn.)

By HERBERT T. PRATT
Technical Service Section, Textile Fibers Department, E. I. du Pont de Nemours & Co., Wilmington, Del.

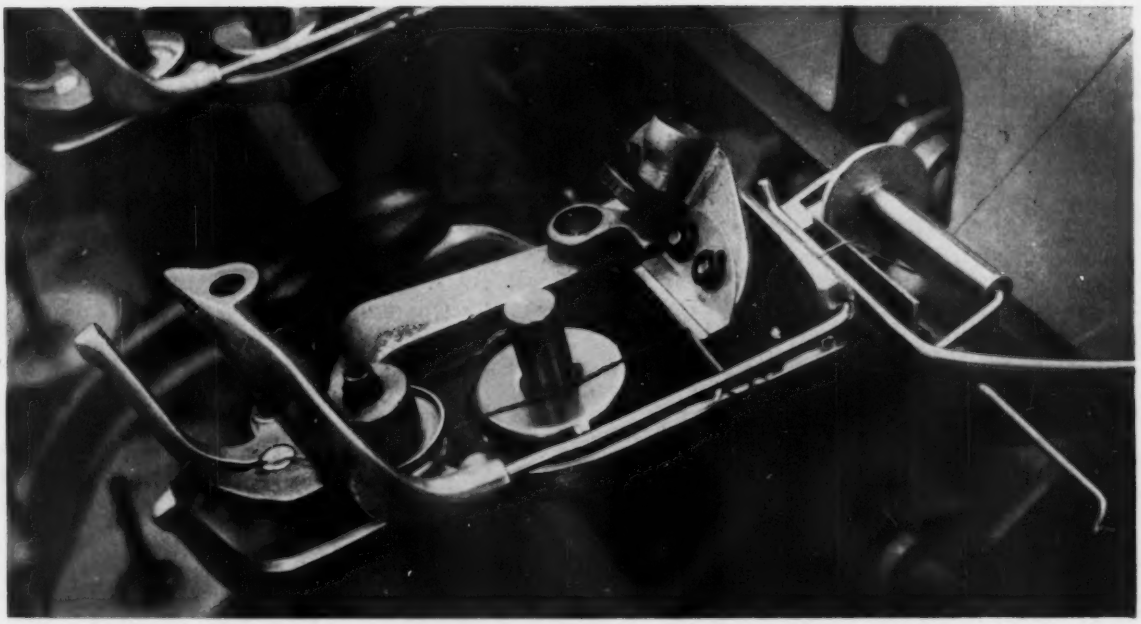
INCREASING BULK

Stress bulking increases bulk of package-dyed yarns and restores their soft hand and round cross section. In the process, yarns are stressed (under tension) to open compressed fibers, and then relaxed. In theory, you can stress yarn in several ways—by snubbing it over tension bars or by drawing it through driven rolls, for example.

Du Pont, however, has come up with a new practical method: passing the yarn over two opposing knife edges. This method provides drag with high tension (illustration on this page). The yarn is rewound at low tension to make a soft knitting cone, and only partially relaxed during this reconing. You can completely relax the yarn after knitting by hot tumbling or by steaming the fabric.

The first knife-edge unit used during backwinding is designed to fit the Foster 102 winder (photo on facing page). But the principle works on any machine.

The amount of bulking and softening of the yarn in the finished



STRESS-BULKING tension unit is mounted here on a Foster 102 winder. The principle, however, works on any winding machine. Besides putting back bulk, the knife-edge unit also catches slubs, eliminating the need for slub catchers.

Back in Package-Dyed Orlon

fabric is directly proportional to the stressing tension used. You can determine satisfactory yarn tension needed for a specific yarn by running a few tests varying the yarn tension. Then, using these test yarns, you can make sample skeins, heat them to 220 F., and compare the bulk.

You can adjust tension on the stress-bulking unit in three ways:

- Change the angle of the knife edges.
- Change the distance between the blades.
- Change the weight on the disk spindle.

You can get a practical starting point for 2/20s worsted yarns by using 35 grams on the tension disk, setting the knives in a vertical position, and using a winding speed of 300 ypm.

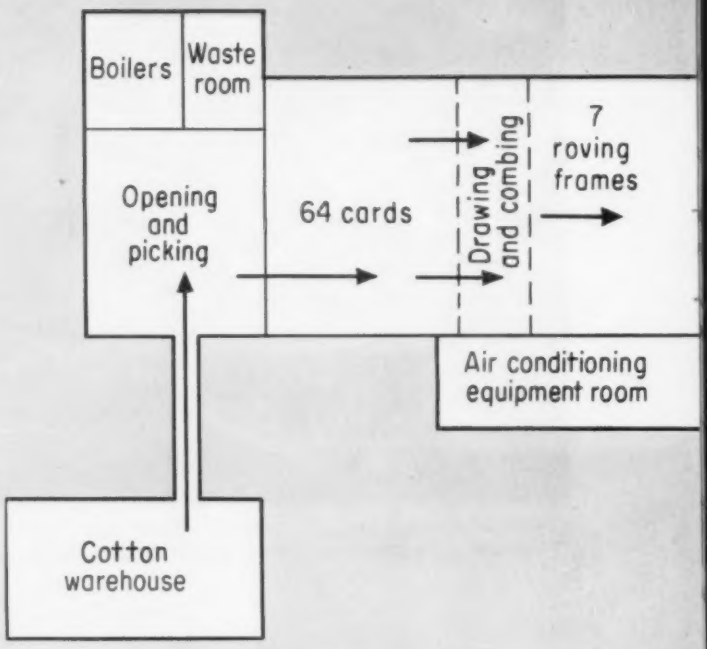
Extremely high tension results in excessive end breakage. But you should check other causes of breakage, such as knife misalignment or nicks, poor yarn uniformity, and high yarn finish.

Because the yarn runs over the knife edges at high speed, short fiber comes out as fly during stressing. But the highest percentage encountered with 2/20s worsted has been 0.5%. The knife edges also perform another duty. They catch all slubs from the Orlon yarn. This, in turn, eliminates the need for having any slub catchers.

How Dyed Acrylic Yarns Compare

	PACKAGE DYED			
	Off Dye Tube	After Stress Bulking	After Steaming	SKEIN DYED
Finish, %	0.21	0.16	0.16	0.24
Shrinkage, %	3.3	2.5	1.6	1.1
Diameter, mils	25.6	29.6	34.3	38.0
Uster unevenness, %	7.7	7.6	7.5	8.3
Denier	963	925	979	1015
Worsted count	8.29	8.61	8.17	7.85
Ply	2	2	2	2
Twist, tpi.	4.7	4.9	4.4	4.8
Tenacity, gm./den.	0.62	0.72	0.88	0.68
Elongation, %	22.9	22.3	20.7	20.5
Toughness, gm.cm./den.cm.	0.098	0.111	0.122	0.108

Here begins a four-part mill story—a case history that reflects all the drama inherent in the textile industry — swift management moves to snatch opportunity, planned modernization, solid growth, and the relentless drive for low cost and high quality. The story on spinning begins on these two pages. For Part 2 (knitting), turn to page 60; Part 3 (quality and cost control), p. 62; Part 4 (plant services), p. 63. All four parts add up to "must" reading for mill management men.



The Grantville Story—Integration

Part 1: Getting Set for Top

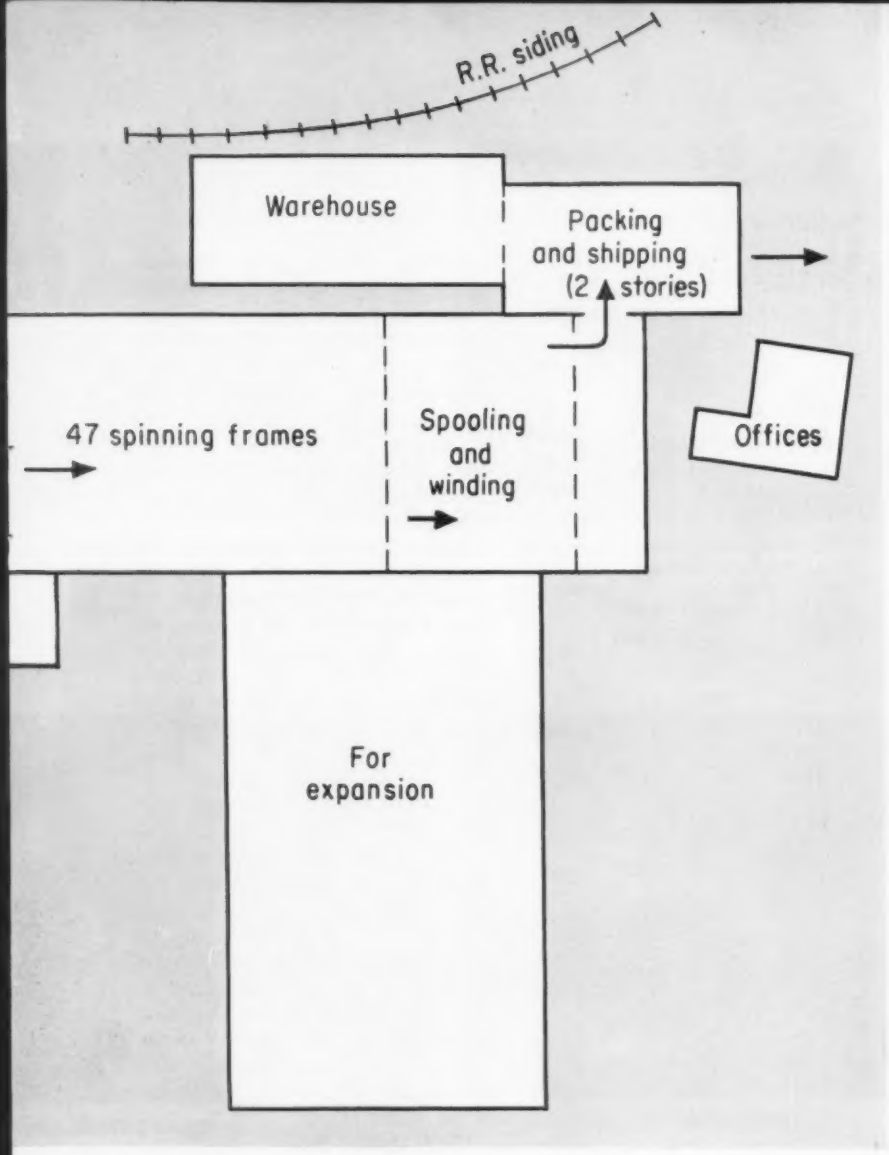
THIS IS THE STORY of a mill that's newly integrated and newly modernized. Integrated because yarn manufacturing has been added to its knitting and garment-making operations. Modernized because the company took over some existing buildings and equipment and, with some canny stretching of modernization dollars, engineered them up to high efficiency in operations, smooth process flow, and top quality.

Where is this modern, integrated mill? It's at Grantville, Ga. There, Flagg-Utica Corp. has just invested $1.5-million in modernization and integrated production. Today, this Flagg-Utica mill is the nation's first and only fully integrated mill making thermal underwear.

Why did the company take over the Grantville properties, when it was already a leading manufacturer of knit goods, apparel, and industrial cloth?

Listen to President J. T. Flagg:

"Our objective was to provide better and more consistent control of quality, costs, and inventory for a substantial proportion of our yarn



PLANT LAYOUT AT GRANTVILLE emphasizes straight-line process flow in spinning. Other departments operate independently of this unit, so exact location of buildings has little effect on manufacturing operations.

TOP-QUALITY YARN comes from modernized spinning frames. Management men (General Superintendent C. S. Smith, Divisional Manager W. S. Flanagan, and Yarn Mill Superintendent H. P. Whaley) keep a sharp eye on quality.

and Modernization

Efficiency, Top Yarn Quality

requirements. Today, the yarn we manufacture at Grantville also serves as a guide to quality standards for the yarn we purchase.

"By using high-quality yarn from our own spinning mill, our Thermal Cloth Department at Grantville can produce cloth that is more stable and of a more consistent yield. Modern equipment, a laboratory, and rigid quality control assure high-quality fabrics at all times."

In the spring of 1959 President Flagg heard that Grantville Mills could be bought. He studied the situation, decided that this property was just what his company was looking for. He lost no time in closing the transaction. Then came more than a full year of engineering surveys, cleaning, painting, modernizing old equipment, buying new equipment, and hiring and training workers.

Grantville Mills now has weekly production of 60,000 pounds of carded and combed yarns, a significant part of Flagg-Utica's manufacturing requirements.

. . . Turn the page

How Grantville's Spinning Is Set Up For Quality Yarn

Yarn number	20s (30 Tex)
Hank roving	1.50
Draft	26
Twist multiplier	3.30
Turns per inch	14.8
Ring sizes (inches)	2 3/16
Bobbin length (inches)	10
Traverse (inches)	9
Front-roll speed (rpm.)	180
Spindle speed (rpm.)	8,400
Traveler speed (fpm.)	4,850
Net weight on bobbin (pounds)	0.33
Contraction allowance (%)	3.0
Production per spindle hour (pounds)	0.05
Production per 120 hours (pounds)	65,000
Doffing cycle (hours)	5.6
Jobload (sides per spinner)	24
Spindles per spinner	3,024
Number of frames	47
Number of spindles	11,844
Break factor	2,300
Efficiency (%)	92
Nonuniformity (%)*	72

* Evenness of yarn surpasses the Uster recommendation for very even yarn (74% nonuniformity).

MANAGEMENT ASSIGNED

To set up and organize the Grantville Division, Mr. Flagg transferred William S. Flanagan, vice president of Flagg-Utica, from Florence, Ala., to the new operation. He now heads it up as divisional manager. A young, aggressive mechanical engineer (as well as administrator), Mr. Flanagan has been with the corporation since 1949. Under direction of executive Vice President M. E. Eisenberg, he has made the Grantville Division an efficient part of the corporate whole.

Flanagan's right-hand man, the one who directly runs the three manufacturing units at Grantville as general superintendent, is C. S. (Shorty) Smith. With many years of experience, including 11 years at Grantville, Mr. Smith is a dynamo of activity and a walking encyclopedia of facts and figures about the Grantville operation. He also lends political prestige to the mill, since he is mayor of Grantville.

Other members of the Grantville management organization are C. E. Dugan, divisional accountant responsible for cost and divisional accounting and reporting; R. O. O'Kelly, production and coordinator; Hugh P. Whaley, superintendent of the yarn mill; W. R. O'Dell, superintendent of the knitting and cloth finishing unit; and Gordon D. Cook, dyehouse superintendent.

NEEDS STUDIED

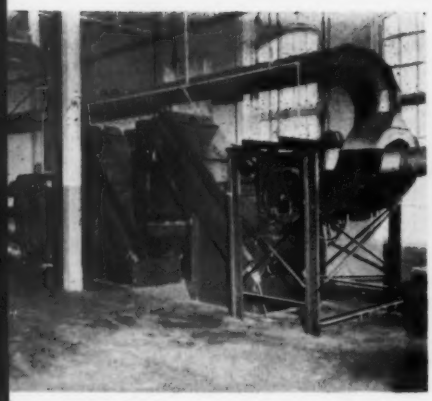
First step in forming the Grantville mills was to study Flagg-Utica's requirements—as a division and as part of the corporation. Basic requirement was to plan, engineer, equip, and operate in 18 months a yarn mill that could produce top-quality knitting yarns as good as (or better than) products of competitive sales-yarn mills—mills that had been making excellent yarn for 30 years or longer. To meet this requirement, Flagg-Utica called in outside specialists to work with company managers.

Key Grantville executives did much of this early work. Ralph E. Loper Co. laid out machinery, set work assignments, and planned the quality- and cost-control setup for the yarn mill. Engineers of Roberts Co. worked closely with the design team in determining spinning requirements for the mill.

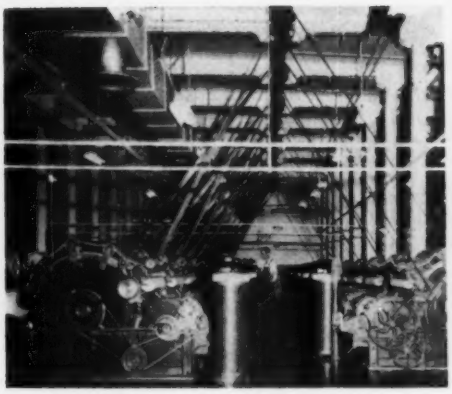
The Flagg-Utica organization itself designed the knitting and cloth units and reworked the dyehouse—made it modern and capable of processing 50,000 pounds of yarn per week. Knitting and cloth-finishing equipment for thermal and raschel fabrics was installed in two existing buildings. Offices, cotton warehouses, and a waterworks building round out the properties now in use at Grantville. Other buildings, now unused, are available for expansion in the years ahead.

Costs during this stage reflected management's resolve up and down the line to spend "only the dollar that would give maximum return in quality, efficiency, and production." Planning required myriad decisions on the balance of material flow. In short, the mill had to produce 500 pounds per hour of high-quality yarn at lowest possible cost. The design team had to select and balance the best machinery at the lowest cost for all processes (table on page 59).

At opening, for example, the team decided that the blending line coupled with a vertical opener (with dead air space) plus two Superior cleaners (with improved grid bars) would give satisfactory cleaning, blooming, and blending for the type of cotton used. Reworking and setting up this equipment cost about one-tenth as much as new equipment would have cost—and it works just as well. One man per shift

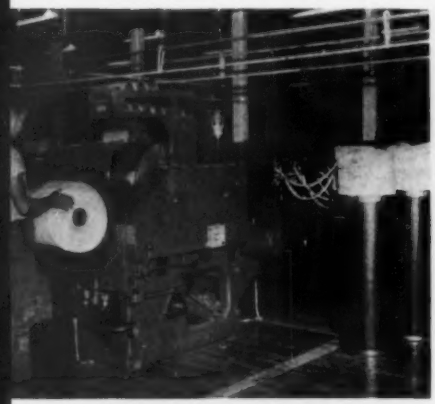


OPENING is done with two cleaners preceded by a vertical opener. Cleaning section now takes out 150% more motes and pepper trash than before modernizaton.

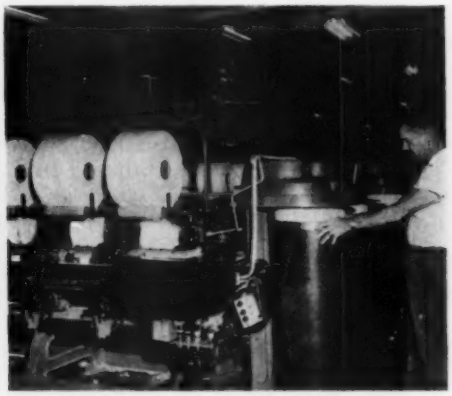


CARDING is done on 64 completely rebuilt units, with metallic clothing and 18x42 coilers with matching cans. Production is 8.8 pounds per hour.

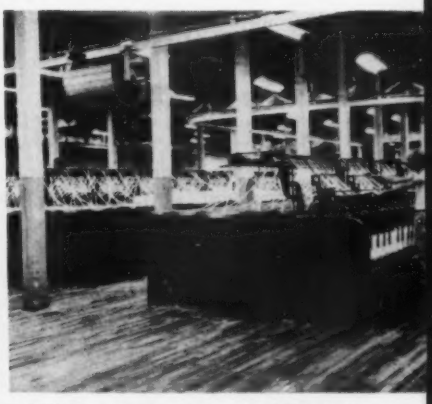
BREAKER DRAWING runs 400 fpm. Operator can speed machines up to 550 fpm., or even faster if the company needs some extra production.



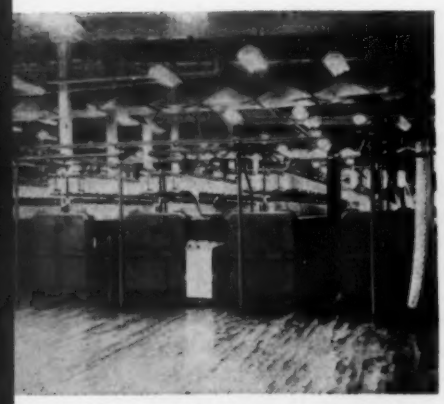
SLIVER LAPPING is done on units that produce 850-grain laps from 20 ends of 42½-grain sliver. Stock goes on to four brand-new combers.



COMBING is done at high speed—27½ pounds per hour per delivery. Total output of the company's combing department is 220 pounds per hour.



ROVING is product of 128-spindle frames, completely modernized and equipped with Adams stop motions. Overhead blower keeps room clean.



SPINNING is done on 47 completely rebuilt frames converted to high-draft operation. Frames produce about 60,000 pounds of yarn weekly.

WINDING operations use six modernized winders with 100 spindles each. Most winder production goes to other Flagg-Utica mills for knitting.

PACKAGE DYEING is done in a building adjacent to the yarn mill. Capacity, 50,000 pounds per week. All equipment is modern.

operates both opening and picking.

Another example of spending "only the dollar that would give maximum return," according to Flanagan, was rebuilding spinning frames and converting drafting elements and spindles to Roberts equipment. He says these machines give the mill the speed, versatility, and quality potential of new frames at about half the cost of new frames.

In this connection, Flagg-Utica men made a detailed analysis of number requirements, breaking strength, evenness, type of package, color, and other features that had to characterize yarns shipped to the company's knitting plants.

GROWTH PLANNED

There is abundant room to grow at Grantville. Included in the Flagg-Utica acquisition is an additional 80,000 square feet of floor space in several presently unused buildings. Approximately 55,000 square feet of this space is usable for manufacturing purposes. With these facilities available, further expansion and modernization are contemplated consistent with the progress now being made, says President Flagg.

The Grantville Division is looked on as an imporant key to the profitable future growth of Flagg-Utica. But mementos of the past are also looked upon by the company as symbols of the progress this basic and ancient industry has already made and the further strides it is capable of attaining.

In this regard, on the wall opposite Bill Flanagan's desk is a large picture frame with a rectangular piece of cloth encased in glass. The legend reads: "This piece of blanket cloth was carded, spun, and woven in the home of Grannie Maggie Neal, who was Lady Margaret, Lady in Waiting to Mary, Queen of Scots, circa 1575 A. D."

OPENING LAID OUT

Appearance, hand, shade, and color of the yarn and fabric produced at Grantville must meet rigid specifications. This requirement makes choice of cotton grade and staple a vital factor in the mill's continuous emphasis on quality-control procedures.

Bales of $1\frac{1}{16}$-in. Bright Middling Central Belt cotton move down a ramp from warehouse to opening and picking room, where they are opened and allowed to bloom. Cotton is well blended here by marks and fed into four Saco-Lowell F-5 blending feeders. Then it goes through a Saco-Lowell vertical opener, two Superior cleaners in tandem, and two two-beater Saco-Lowell pickers producing 12-oz. laps at 350 pounds per hour. Each picker turns out one 56-lb. lap every 9.6 minutes, or 6.25 laps per hour. Cotton moves automatically through the machines.

CARDS REBUILT

Management decided to rebuild the existing Saco-Lowell and Saco-Pettee cards—completely dismantled, steam-cleaned, painted and rebuilt them, and added metallic clothing, 18x42-in. coilers, and cans. Cans hold up to 40 pounds of sliver. The Hollingsworth metallic clothing saves waste and eliminates the need for hourly stripping. Cards today get a general cleaning and stripping once a week.

Production at 96% efficiency on 50-grain sliver is 8.8 pounds per hour per card, or 563.2 pounds per hour for the card room.

DRAWING SPEEDED

From the cards, 50-grain sliver passes through three Ideal breaker drawing frames with four deliveries each. These machines turn out 42.5- and 50-grain sliver at 400 fpm. They are equipped with special motors to step up speed to 550 fpm. when more production is needed. At the higher speed, production would be 43.3 pounds per hour per delivery for a total of 520 pounds per hour for 12 deliveries. Sliver is delivered into 16x42-in. cans holding 35 pounds each.

Then, part of the drawing-frame production is separated from the straight-process flow and is prepared for combing. Stock to be combed is shunted to a lapper and combers before it passes through finisher-drawing operations. Sliver designated for carded yarn (about 60% of Grantville's output) moves to finisher drawing.

Finisher drawing is done on three Ideal drawing frames with the same operating features and production capability as the breaker drawing. Here 50-grain sliver is delivered into 16x42-in., 35-lb. cans and moved to the roving area.

Lighter-weight (42.5-grain) sliver prepared for combed yarn goes into a Saco-Lowell lap winder that turns out an 850-grain lap, 20 ends up. These laps then move to four new two-delivery Saco-Lowell Model 57 combers, each taking six laps to a side. Here, 50-grain sliver is produced at 27½ pounds per hour per delivery, or 220 pounds per hour off all the combers. It is put into 16x42-in., 35-lb. cans. Next, sliver is fed through the Ideal finisher drawing.

A Bahnson ceiling cleaner on overhead tracks serves the carding and drawing areas.

ROVING FRAMES UPDATED

The roving department has seven modernized Saco-Lowell 128-spindle 10x5 frames equipped with J-3 drafting and Adams stop motions. Frames are set up for high-density packages. Production (at 84% efficiency) is 0.61 pound per spindle-hour. About 1.75 pounds of roving is put on the 10x5 package. Flyer speed is 800 rpm., front-roll speed 156 rpm., and roll diameter 1⅛ inch. Hank roving is 1.50.

Cans in carding, drawing, combing, and roving are equipped with spring bottoms.

SPINNING MODERNIZED

Grantville has modernized 47 frames by converting Roth-type spinning to Roberts High-Draft. The frames have 3½-in. gage and 252 spindles each. Total number of operating spindles: 11,844. Roberts frames are double-creeled and set four to a bay in 11 of the 12 bays. One bay contains only three modernized spinning frames, thus provides easy access to oil and gear rooms.

Roberts frames, operated at 8,400 rpm. spindle speed, produce 20s (30 Tex) cotton knitting yarns from 1.50 hank roving with a draft ratio of 26 on 2 3/16-in. rings. About 5¼ ounces of yarn are put on 10-in. bobbins. Jobload is 24 sides per spinner, or 3,024 spindles.

The spinning modernization alone

How Material-in-Process Flows at Grantville

cost $250,000. It includes Roberts double-apron, 3-line, no-oil, cap-bar-and-saddle drafting system, Bijur one-shot lubrication, hardened bottom rolls with Evengrip fluting, individual tape-drive pulley conversion, and an improved builder motion. The builder provides a tighter-wound, heavier package than older motions. Other spinning improvements include Roberts Aero-Creels for 10x5 double roving, Unit-Vac power section cleaning, high-speed rings, and latch-type bobbin holders; new motors, starters, and variable-speed drives; and nearly 12,000 new Supreme high-speed ball-bearing spindles. Each spindle has extra-wide ball bearings grease-packed for life.

Frames were steam-cleaned and painted. Inspectors examined all parts retained and replaced them where necessary. Always, new parts.

No top-roll oiling is needed with the new cap-bar-and-saddle system. Accuracy of the hardened steel top rolls is within 0.001 inch.

WINDING IMPROVED

All yarn produced at Grantville moves from spinning frames directly to a new Barber-Colman Model CC spooler—a four-number, 252-spindle machine with vacuum cleaning and return air condenser. It produces 2½-lb. cheeses at 1,110 ypm. Efficiency is 87%.

According to Mr. Flanagan, use of the spooler prior to winding—although an added operation—provides many advantages and actually improves quality and speeds up production. Reasons: In putting up 2½-lb. cheeses at high speeds, the spooler shakes off any fly or leaf remaining in the yarn. What's more, the large package (compared with the smaller 5½-oz. spinning bobbin) greatly speeds up rewinding and enables each tender at the winders to handle more production.

Depending upon the end use of the yarn, production from the spooler is handled in one of three ways:

1. Yarn to be shipped to other Flagg-Utica divisions is rewound onto knitting cones by six overhauled Foster Model 102 winders of 100 spindles each, then packed into 96-cone cases for shipment.

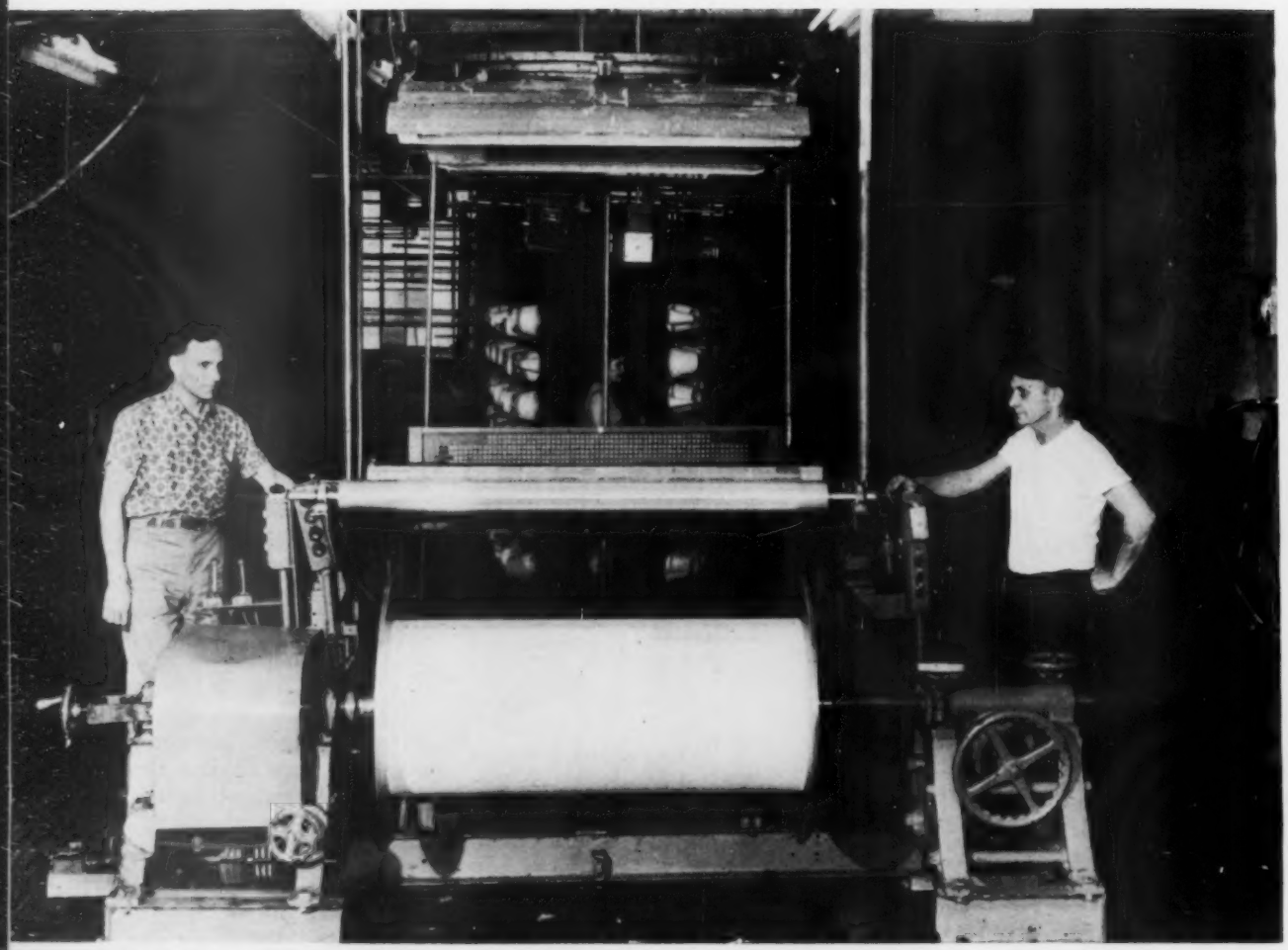
2. Yarn to be knit into thermal fabric in the knitting and cloth finishing building is moved via pin trucks. It goes directly into creels for warping knit beams.

3. Production from the spoolers destined for the package dyehouse is put up on perforated stainless-steel cores, then put on pin trucks.

Now, for Part 2 of the Grantville story, turn the page ▶

 . . . Begins on page 54

Part 2: Tops in Raschel Knitting



BEAMING is done at 400 ypm. speed at close tolerance in beam diameter because two 50-in. beams must function as one 100-in. beam on each side of raschel machines. A well-beamed warp is the key to good raschel knitting.

FLAGG-UTICA at Grantville today is producing over 30,000 pounds per week of finished double-bar, raschel (double-knit), thermal underwear. This is its first venture in the raschel-knitting field.

The thermal-cloth department, occupying 23,000 square feet, warps, knits, and finishes the fabric. William R. O'Dell, a textile graduate of Clemson College, heads up the department, bringing to the job his fine experience in both yarn-mill operation and raschel knitting.

Basis of good raschel knitting is a well-beamed warp. Grantville uses a specially designed warper with pneumatic presser-roll control. Finished warp beam must be within $\frac{1}{16}$ inch of the same diameter from end to end. Failure to maintain this specification means that the beam must be run by itself at the knitting machines—a sure way to cut production seriously.

Beaming is from 2½-lb. cones. Beams are aluminum, 30 inches in diameter and 50 inches wide. Yarn ends per beam range between 262 and 327, according to the required body size of the finished garment. Finished-beam weight is 500 pounds; average length of yarn on a beam, 34,000 yards. Beamer speed is 400 ypm. Yarn is kept clean of lint by an overhead mechanical cleaner at the creel.

For knitting, Grantville has 12 late-model Mayer Textile Machinery Corp. machines. Four machines are 150 inches wide, and 8 are 100. On an average, 1,800 yarn ends are

PRODUCING two of three panels of fabric per machine, 12 machines turn out over 30,000 pounds of 10-oz. finished double-bar, raschel (double-knit), thermal cloth each week. Raschel knitting requires highly even yarn.

fed to the 150-in. machines, 1,200 to the 100-in. units. Machines run 400 stitches per minute.

Because of stitch construction in thermal-type raschel-knitted fabrics, evenness of yarn is essential. Quality control throughout the mill is imperative to produce uniform lengths of perfect cloth. Because construction and yarn number reflect directly in the weight of the thermal cloth, constant yield checks are made on all shifts to be sure yield does not vary significantly.

FINISHED FOR STABILITY

Cloth from knitting machines is sewed in tubular form, inspected on inspecting machines, and placed on flat-bed trucks. Defects are cut out—not mended. Fabric is taken directly from these trucks to stainless-steel dyebecks, where it is scoured and bleached or dyed in the tubular form.

Steam-heated tumblers, 42 inches wide, dry the fabric to insure minimum shrinkage. Careful cross checks of operating temperatures assure consistency of shrinkage.

Cloth is finished on a sweater steamer (Tubular Textile Machinery Corp). Width is closely controlled during steaming. Cloth is plated off the steamer on pallets.

Finished fabric is book-folded on individual platforms in 65-yd. lengths and conditioned at 75% r.h. for stability.

Now, for Parts 3 and 4 of the Grantville Story . . .

Turn the page

QUALITY CONTROL is uppermost with Manager W. S. Flanagan (right), who often joins B. B. O'Neal, lab chief, in checking roving evenness.

Part 3: Controlling Cost And Quality

UNDER the administration of Mr. Flanagan, Flagg-Utica Grantville management keeps cost and quality under strict control. This policy is in keeping with the objectives outlined by President Flagg when his company moved into spinning. He said: "We will maintain a tight rein on costs by having a perpetual diagnosis of our operations rather than the inadequate periodic or monthly autopsies."

COSTS HELD DOWN

Costs are controlled under the direction of Divisional Accountant Dugan. The tools: perpetual audits and reporting records so operating people are constantly and immediately aware of any deviation that might increase costs. By the same token, these men are constantly made aware of the areas in which costs can be further reduced.

All cost information speeds straight up to Mr. Flanagan and on to Flagg-Utica's Executive Vice President Eisenberg and Financial Vice President J. E. Vilagi. This communication line provides top management with vital information about Grantville's relationship to the corporate position.

At the Grantville plant, perpetual audits are based on weekly breakdowns of labor and material at the cost centers of opening and picking, carding, combing, drawing, and roving. Findings are grouped into a central category covering the entire card room. Spinning, spooling, winding, and packing costs are broken down individually.

This auditing operation covers both material and labor costs per week. This way, "over" and "under" figures can be compared with standards. If some particular item seems out of line, responsible operating people are alerted at once. They make corrections or adjustments.

Full operating reports are summarized every four weeks (13 times a year). At the same time, inventories are made at each control point. Daily hank readings and daily pounds produced are supplied to operating men on each shift.

QUALITY HELD HIGH

Quality and cost together set the pace in selecting machinery and setting up process flow.

Grantville has trained each shift foreman to run constant quality-control checks through each step of the process. This way, there are 105 control checks a week from opening of cotton to shipment of yarn.

Cleanliness is emphasized as a vital part of quality control. Plant cleanliness habits are closely supervised, and cleaning operations are continuous. Lots of mechanical cleaners supplement or replace manual cleaning.

The laboratory, with air conditioning and humidification, is fully equipped. It performs departmental quality-control functions and does some project testing. Fundamentally, its primary role is quality control. Its secondary function is research. It is supervised by Blanton B. O'Neal, who before joining Grantville was associated for 15 years with the physical testing laboratory of U. S. Rubber Co.

The lab conducts the following tests on cotton, yarn, and cloth:

COTTON

Staple
Grade
Moisture content
Nep count
Foreign matter
Dye affinity
Maturity
Micronaire

YARN

Break
Weight
Extractable matter
Evenness
Moisture content
Washfastness
Shade matching
Appearance
Lightfastness

CLOTH

Weights
Construction
Thickness
Extractable matter
Moisture content
Shrinkage
Washfastness
Ball burst
Shade matching

Lab equipment includes brush uniformity analyzer, skein reel, Scott skein tensile tester, Scott single-end tensile tester, Micronaire, Shadograph, twist counter, microscope, MacBeth light, Emerson oven, Launder - Ometer, Fade - Ometer, shrinkage tester, crock meter, Taylor comparator, water testing and control equipment, analytical balances, and ultra-violet light.

Part 4: The Best in Plant Services

EVERY DOLLAR spent at Grantville had to go a long way—fast. So Flagg-Utica's management team surveyed existing service equipment before modernizing the mill. Much of this equipment turned up on the asset side of the ledger.

Foremost on the plus side were the waterworks, the waterworks building, and abundant water for present and future needs—enough to supply a town of 10,000 people.

The boilers were not new, but they were safe, serviceable, and reasonably efficient. So they're being used. Georgia Power Co. supplies electric power for the Grantville mill. Natural gas fires the 600-hp. boilers, which provide heat and process steam at 100 psi.

NEW AIR CONDITIONING

One big gap to fill in service equipment was air conditioning. Over-all cost: $125,000.

In seeking evenness of yarn for raschel knitting, with cotton as a raw material, management decided air conditioning was a necessity. Raschel knitting is inherently best for filament man-made fibers that are uniform in size and have a consistently high-test break strength. Such uniformity and consistency is hard to achieve with cotton—unless you go all-out for air conditioning.

That's why Flagg-Utica went for air conditioning of Grantville. Management called in Robert & Co. Associates to design a suitable system, take competitive bids, and supervise installation. Object: accurate climatic control at minimum cost. Today the entire yarn-mill area—over 47,000 square feet—is fully air conditioned with a refrigeration system.

First step in air conditioning the mill was to close in the windows with concrete blocks and seal off the 50x470-ft. monitor. Along with this work, the entire mill got fresh paint and new floors. Over-all painting time was four weeks; spinning department, 10 days.

Air-conditioning plant is a 320-ton Trane unit with a 254-hp. compressor that produces 126,000 cfm. of air. This climate-control air-conditioning system was built and installed by Bahnson Co.

All air-handling and refrigeration equipment is outside the building. And all equipment except cooling tower and accessories is enclosed with insulated sheetmetal. But the equipment is close to the mill. This way, cleaning is easy, and so are routine checks for correct operation. What's more, initial investment was lower.

The system is the central-station, air-washer, split type. It consists of three major components:

1. A supply-air system with aluminum ductwork and circular ceiling-type Barber-Colman air diffusers. Air is supplied by a single air washer and centrifugal fan driven by a 75-hp., 1,800/900-rpm. electric motor with capacity of 126,000 cfm. of air at high fan speed.

2. A refrigeration system with a capacity of 320 tons. Compressor is a hermetically sealed model driven by a 254-hp. electric motor.

3. An atomizer system with 116 atomizer heads. Sixty atomizers are around the periphery of 12 of the 28 circular supply-air diffusers. There's also space for future automatic water strainers and for automatic air filters.

Dry-bulb temperature in all conditioned areas is 85 F. Relative humidity in the spinning room is 42%. All other manufacturing areas are maintained at 52% r.h.

CONTROLS—ALL THE WAY

Controls for the system are for four different types of operation:

- Normal operation with an evaporative-cooling cycle.
- Normal operation with the refrigeration cycle when the outside wet bulb is above the temperature at which the conditioning space can be held at correct conditions by evaporative cooling.
- Week-end operation.
- Emergency operation.

Primary system control is by dew-point controller (sensing bulb averages dew-point temperature at the leaving side of the air washer). The dew-point controller modulates outside-, return-, and relief-air dampers during the evaporative-cooling cycle. When the controller is on the refrigeration cycle, it modulates the suction damper in the suction of the refrigeration compressor to maintain the desired water temperature in the air washer.

The yarn-manufacturing area is separated into three zones for control. Each zone has a thermostat and a humidistat arranged to operate bypass dampers and steam valves on heating coils. Zone humidistats also control atomizers. At a rise in zone relative humidity, atomizers in that zone are shut off. At a further rise, zone bypass dampers are closed. At a still further rise, the zone steam valve is opened to add reheat. Reverse of this sequence takes place at a drop in relative humidity. Modulation of steam valves by the zone thermostats maintains space temperature during normal weekday operation and over the week end.

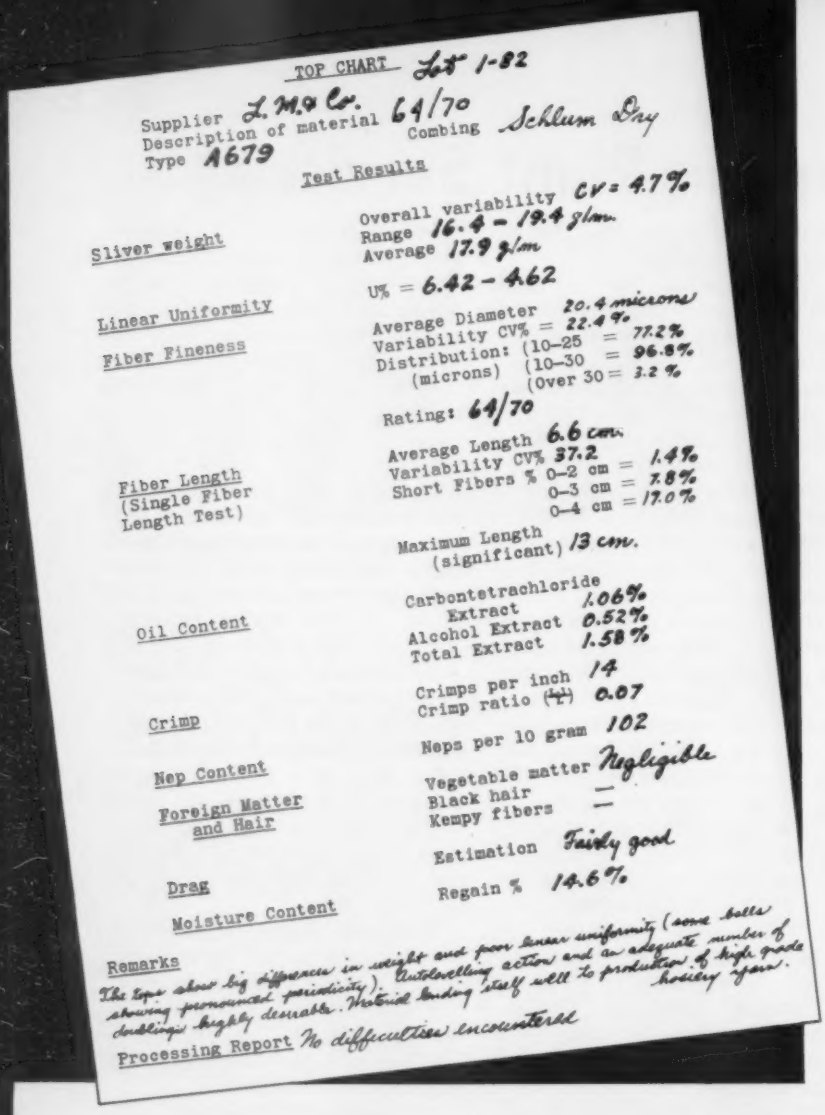
Week-end control—Control is switched from normal to week-end operation. Here's what takes place:

- Supply-air fan is operated at low speed instead of high speed.
- Dew-point controller is removed from the control system.
- Atomizers are turned off.
- Humidistat is energized for week-end operation.

The week-end humidistat cycles the air-washer spray-water pump over a range of 10% r.h. to maintain average room relative humidity slightly lower than for normal plant operation.

Emergency control—In an emergency such as fire, a manually operated switch is activated. Controls then perform the following functions to remove smoke from the conditioned area so that firemen can do their work without running the risk of asphyxiation:

- Brings supply-air fan to high speed from either low speed or stop.
- Opens outside and relief dampers fully so that fresh air replaces smoke-laden air.
- Closes air-return dampers fully so that smoke-laden air will not be recirculated in the room.



TOP CHART Lot 1-82

Supplier L.M.& Co.
Description of material 64/70 Combing Schlum Dry
Type A679

Test Results

Sliver weight
Overall variability CV = 4.7%
Range 16.4 – 19.4 g/m.
Average 17.9 g/m

Linear Uniformity
U% = 6.42 – 4.62

Fiber Fineness
Average Diameter 20.4 microns
Variability CV% = 22.4%
Distribution: (10–25 = 77.2%
(microns) (10–30 = 96.8%
(Over 30 = 3.2%

Rating: 64/70

Fiber Length (Single Fiber Length Test)
Average Length 6.6 cm.
Variability CV% 37.2
Short Fibers % 0–2 cm = 1.4%
0–3 cm = 7.8%
0–4 cm = 17.0%

Maximum Length (significant) 13 cm.

Oil Content
Carbontetrachloride Extract 1.06%
Alcohol Extract 0.52%
Total Extract 1.58%

Crimp
Crimps per inch 14
Crimp ratio (h/l) 0.07

Nep Content
Neps per 10 gram 102

Foreign Matter and Hair
Vegetable matter Negligible
Black hair —
Kempy fibers —

Drag
Estimation Fairly good

Moisture Content
Regain % 14.6%

Remarks
The tops show big differences in weight and poor linear uniformity (some balls showing pronounced periodicity). Untwisting action and an adequate number of doublings highly desirable. Material lacking staff will to production of high grade hosiery yarns.

Processing Report No difficulties encountered

Top chart is starting point for a . . .

Fresh Look at Quality Control

Today the pressure is on for more and better quality control. Techniques and methods are growing more exact—and more exacting. This fresh look at the science may show you how to tighten up your system.

HOW LONG since you took a fresh look at your quality-control system? How long since you tightened it up? How long since you upgraded and updated it?

It doesn't matter what kind of operation you are running—cotton, wool, or man-made fiber—spinning, weaving, knitting, or something else. What you do about your quality-control system—right now—could set the direction of your sales curve and your profits curve in the months just ahead.

Suppose, for instance, your operation is worsted drawing and spinning. Starting point for your quality-control system is a well-equipped and well-staffed laboratory—the kind you can pin your faith on.

The position of this laboratory on the organization chart and its relationship to the quality-control department may vary from company to company. The important thing is that it be independent and that it follow a fixed schedule of tests and checks.

How do you man the lab? Certainly not 100% with scientists, engineers, and professional technicians. As a matter of fact, a good percentage of your lab people should be former mill employees who have been trained in lab techniques. These mill people will be especially useful in spotting defects.

Your quality-control system should be set up to embrace the whole field of processing—raw material to finished yarns. In simplest terms, this means a five-way breakdown, as follows:

1. RAW-MATERIAL CONTROL

Raw-material control has the following ends in view:

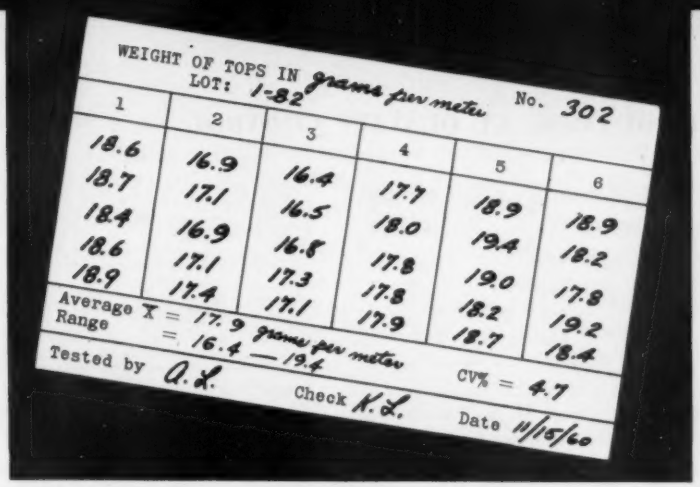
- To select wool tops that are suitable to the machinery available and to the product's end use.
- To check conformance of the tops to the sample used for reference purposes.
- To forecast performance in processing.

Tops should be examined for all characteristics that you can measure objectively or can evaluate subjectively—all characteristics that are

By A. TAVALER, A.T.I.
Technical Manager
Merino Worsted Spinning Mills Ltd.
Petah Tiqva, Israel

likely to affect the behavior of the material in processing. It is best to enter results in a Top Chart (facing page). This chart should include suggested settings, recommended treatment (e.g., oil or antistatic), and (at a later stage), observations relating to the behavior of the material in processing. Data on percentage of short fibers, distribution of fiber length, and variation in fiber thickness will be especially valuable in forecasting performance.

The question of bias in drawing samples is of paramount importance in raw-material control. Correct sampling procedures as established by official standards should be your guide to insure that you draw representative samples.


WEIGHT OF TOPS IN grams per meter No. 302
LOT: 1-82

1	2	3	4	5	6
18.6	16.9	16.4	17.7	18.9	18.9
18.7	17.1	16.5	18.0	19.4	18.2
18.4	16.9	16.8	17.8	19.0	17.8
18.6	17.1	17.3	17.8	18.2	19.2
18.9	17.4	17.1	17.9	18.7	18.4

Average $\bar{X}$ = 17.9 grams per meter
Range = 16.4 — 19.4
CV% = 4.7
Tested by Q.L. Check N.L. Date 11/15/60

TO CHECK EFFICIENCY of Autoleveller devices—one step in process control—weigh successive 1-meter lengths of sliver and find the percentage variation in weight of these pieces of sliver.

2. PERFORMANCE TESTS

These tests serve as a "barometer" of conditions in the mill—will tell you whether "fair weather" or "rain" is in store.

Three types of tests supply the required information. Compare the results obtained with existing standards and note the degree of conformance or nonconformance of the two sets of values to one another. Then draw your conclusions on the state of the run.

These tests are required:

• **Uster results** of all passages and comparison of these results with Uster standards.

Evenness is the superlative requirement in worsted yarns. That is why these tests are of paramount importance for the successful performance of the run. Suitable adjustments of settings in early processes, as suggested by the Uster test results, will do away with many a trouble in later stages.

• **Tests of yarns** for strength and extension, and comparison of the results with specifications established by the buyer or the mill.

However even a yarn is, its utility will be judged by its performance in subsequent operations. In these, both strength and extension are important. To cover all contingencies, you will need as many tests as possible. Single-thread tests are to be preferred, because they give more detailed information. The coefficient of variation (C.V.) of the results will give an image of strength and extension uniformity in the yarns.

• **Tests of performance in use.** That is, yarn performance in knitting and in weaving.

Small but frequent tests of samples drawn from the run will illustrate further performance and may pinpoint defects and troubles that are likely to become the cause of complaints. An analysis of deficiencies spotted this way may suggest, even at this late stage, how to prevent such occurrences and how to eliminate faults that may exist in the material already spun.

Problem: Small but frequent tests may reveal a thicker streak of material extending from a few centimeters to a few meters. The streak may be due to a spinner's double. Since routine Uster tests involve a limited number of bobbins, they may not reveal occasional occurrences of this type. What is more, extensive tests for long-term variations will not be affected much by a defect of limited length.

Remedy: Tighten up on supervision of spinners' work. Talk to operators, emphasizing and illustrating the damage so often caused by careless work.

Problem: The cloth may show occasional defects extending mostly over short lengths. This could be due to an unduly high thickening of the single yarn. This thickening, in turn, may be due to faulty drafting in some of the spinning heads or to improperly made piecings in later drawing operations. Defects like these are usually chargeable to poor performance by operator or by your machine.

Remedy: Get the quality-control department to recommend ways to prevent these defects.

Wear and pilling tests of the completed fabric—knitted or woven—will show whether it conforms to specification.

3. PROCESS CONTROL

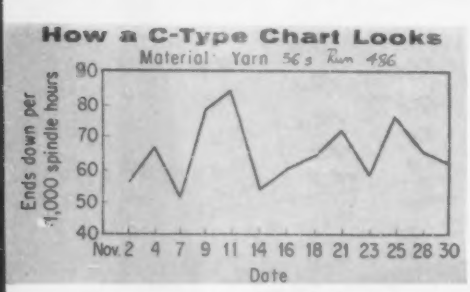
Process control covers a complete series of tests. These tests are designed to insure that an established set of conditions continues to prevail and that therefore no changes in such characteristics as weight, twist, and uniformity occur.

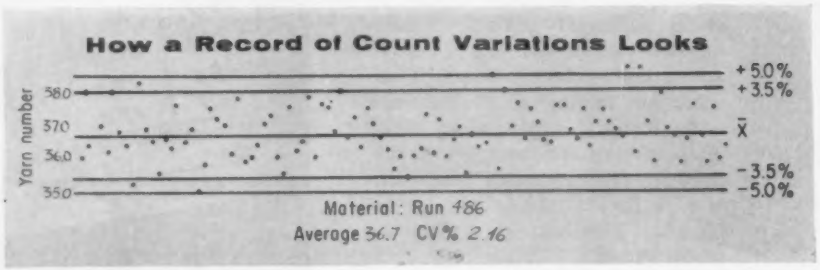
Here are some suggested courses of action:

• Set up $\bar{X}$ & R Control Charts for checking variations in the weight of slivers, rovings, and yarns. A check on one of the initial operations, in addition to the rover and the spinner, will provide for most contingencies. In a mill with no air conditioning there is an additional difficulty in testing: Variations in weight in this type of mill may be partly due to variations in moisture content. In such a mill, put reliance on conditioned weights only, even if this does mean unavoidable delays.

• Check spindle speeds of spinning and twisting frames with a stroboscope. In Bradford-type machinery, check the speed of drawing spindles as well.

• Check the efficacy of Autoleveller devices by weighing successive meter lengths of the sliver and establishing the percentage variation in weight of these portions of sliver (chart above). This efficacy





TO EVALUATE DEFECTS, try C-type quality-control charts, plotting the number of ends-down per 1000 spindle hours. Or you can plot on graph paper the yarn count from 100 to 200 bobbins and see how the counts fall within your limits.

check may be especially beneficial in Autolevellers in which motion to the speed-changing device is transmitted by a belt.

• Establish the uniformity in weight of the hanks delivered by the reelers.

4. EVALUATING DEFECTS

Defects are variations from the normal characteristics of the yarn. You can't avoid them altogether. But you can keep them within specified limits. They include ends-down and long-term variation in count. Analyzing the cause of such occurrences rather than their extent will lead to useful conclusions, which can be embodied in specific recommendations about details of processing. Whenever possible, a separate department in charge of research and development should do this work. This department, rather than quality control, is better fitted to investigate the complex factors effecting such characteristics.

Two types of tests are suggested:

• **Determine the number of ends-down per 1,000 spindle hours.**

The frequency of such checks and the period over which observations are made are matters for each firm to decide for itself. It is a good idea to make more intensive observations at the start of every run. C-type quality-control charts (above) work well here.

The C-type chart is useful in seeing that the general level does not exceed a given height and in detecting the time tendencies for deterioration. On the other hand, in a slightly different form, the C-type chart can be used to control groups of frames, with the aim of finding out whether some frames are consistently showing higher (and also lower) results than other frames in the same group.

• **Determine the yarn count from 100 to 200 bobbins** taken from all frames spinning the same yarn. Collect bobbins in course of a few days.

You could plot the results in form of a frequency diagram. Or, to dramatize strong deviations from the average, you could plot them on graph paper along a central line representing the calculated average. Calculate the C. V. percent of the results (showing the level of the long-term variations) and compare it to the standard.

You should also find out the extent of extreme yarn-count values in the material, because these may be the cause of the streaky portions of cloth. In the absence of specifications for this aspect of yarn uniformity, you can draw arbitrarily chosen limits on the graph ($\pm 3.5\%$ and $\pm 5.0\%$). Most results will fall within the inner limit. An excess of results that falls beyond the outer limit would warrant an investigation into causes.

5. LOOKING FOR DEFECTS

The term "defect" as used here includes not only features that demand rejection but also such undesirable features as hairiness, lack of uniformity of cones, unsuitable regain in yarns, and the like.

• Screen all yarns on tubes or cones. Examine them for build and external defects, labeling, cleanliness, overlapping threads, uniformity of size. Occasionally faults may be revealed that would have passed undetected and therefore uncorrected but for this check.

• Rewind a suitable proportion (to be determined in each individual mill) of finished-yarn packages in hank, cheese or cone form. Set clearers very close so as to intercept any remaining faults in the yarn (such as slubs, snarls, outsize knobs, additional threads run in), thereby obtaining an image of the state of the material. Investigate causes of yarn breaks in the course of this special winding operation.

You could use this type of test for yarns on spinning or twisting bobbins when trying to explain the faults (and their causes) produced in these or earlier operations. Here again is a wide field for investigation by your research and development department.

• Make Seriplane tests occasionally on finished yarns to evaluate appearance and degree of hairiness. Though this test relies on subjective judgment, the evaluations obtained are valuable and the assessments made by various trained people will largely agree.

• Try some of the newly developed test instruments. They will give you a numerical evaluation of defects such as thick places, thin places, and neps.

• Set standards for packaging. Spot inspection at this stage will insure that your instructions for packing are enforced.

• Test finished yarns for regain, especially if they are sold on an unconditioned basis. Adjust the amount of moisture take-up to a certain standard, which should be applied for all runs.

Interpreting Your Test Results

Test results contain a wealth of information. For example, in addition to an average figure reflecting the general level or the over-all trend of the property that was investigated, you can calculate (using suitable statistical methods) data on the extent of the variability of the results, their reliability, and their ability to point to conclusions.

With the right statistical methods you can fully exploit the facts revealed by the tests. Also the misleading impression you may gain from results that have not been properly interpreted or have been presented in an incomplete form makes the use of the right methods imperative. While a knowledge of statistics may not be required of every textile technician, it is important for the technician to be aware of such methods for interpreting results and to develop a state of mind that will prevent him from relying blindly on a certain result or using an average figure as final proof or disproof.

This article is hardly the place to describe statistical methods fully. You can find such descriptions in textbooks and highly specialized publications. But there are some practical aspects of these methods—and some suggestions for applying statistics to everyday technical problems in the mill.

Two statistical concepts are widely employed in interpreting test results. A full understanding of their meaning will help you appreciate the information supplied by the tests. These are:

• **The Concept of the Limits of Confidence**—This concept means that the average value obtained will depend on the number of tests carried out and on the extent to which individual results vary from one another. These factors will vary from case to case and may even vary in repeated tests of the same characteristics, with consequent changes in the size of the average value computed for each one.

You should thus be aware that the average value used in interpreting a certain result must not necessarily be the numerical entity calculated by adding up all results and then dividing the sum to the number of results. But, rather, you should be aware that it is a value that may be falling within a range (the Confidence Interval) that can be assessed. The two end points of this interval mark the extent of this range. Their inclusion alongside the average value warns up against too rigid a reliance on a numerical average value that may, after all, differ from the one that was calculated.

• **The Concept of Significance**—This relates to the quality of reliability you can place on a certain conclusion that seems to be indicated in light of the results obtained. It is a useful tool in enabling you to decide whether a difference in results should be considered as an important or significant one that warrants action on the part of the quality-control department, or whether the change or the difference is casual and can be attributed to the intrinsic variability of the material without a modification of substance having taken place.

You should be wary in reaching conclusions based on comparing two results that differ from one another. Most of the time it will be found useful to carry out a significance test to determine whether the difference found is "real."

APPLYING RESULTS

Here are some of the types of significance tests used and some suggested fields of application:

1. You can use the significance test for the difference between an observed and a reputed mean if you are faced with a discrepancy between measured values and the expected result. This is a common occurrence when, in determining the count, the tensile strength, or the twist of yarns, you compare results with the specified values. The result of the significance test will enable you to decide whether you have achieved the required level or must make a change in processing details.

2. You can apply the significance test for a difference between two means in such cases as these:

• To establish whether two types of machines, or two different settings, or two different systems produce a real change in properties of slivers, rovings, or yarns.

• To establish whether an external factor (e.g., dyeing, storing, addition of chemicals, time) has influenced the feature you investigated.

• To establish whether two observers, using the same testing methods and arriving at different results, have used the same standard of judgment. For example, in measuring mean fiber diameter of wool fibers, two observers arrive at different results that entail classifying the fibers in different groups of fineness. The procedure to follow is to establish the significance of the difference between the two means. If the difference is significant, then the observers have used different standards of judgment.

3. You can use the significance test on a difference between an observed proportion and a reputed one. (Observations relating to some property of the material can be expressed as a proportion—for instance, the proportion of neps per unit length of top.) You can judge efficiency of a blending system, for example, by establishing the proportion of the two components, comparing the result with the specific requirement, and finding whether any discrepancy thus revealed is significant.

4. You can apply the significance test to the variability of a material as expressed by its standard deviation ("sigma") to establish whether variability has not been affected by an external factor. Thus we distinguish between significance tests relating to (a) the discrepancy between the reputed and the observed "sigma" and (b) the discrepancy between two "sigmas."

As an example of (a) you may consider a discrepancy found when, following a change in drafts or number of passages or number of doublings used, the long-term variations in yarn counts are compared to those previously established.

The technique (b) can be used to determine whether an additional irregularity has been introduced. If, for example, a yarn is twisted on two types of twisting frames and the average twist is equal for both frames, you may wonder whether one of the frames—or a different tensioning device used by one of the machines—does not introduce an additional irregularity. Establishing the significance of the difference between the results from the two frames gives you the required answer.

Getting Top Maintenance Men

The trend to automation means a bigger burden on mill maintenance departments. Here are pointers on setting up a program that will help you train the specialists maintenance demands today.

TRAINING IS an overhead item in most industries. Is it worth what it costs?

Best answer is that a company pays for a training program whether it has one or not. If you have a machine that requires three hours for repair when training could reduce repair time to one hour, the extra two hours are training costs.

MORE COMPLEX

Factory equipment is becoming more and more complex. So are maintenance problems. You'll lose many of the advantages of new and improved equipment unless you can keep trained maintenance personnel abreast of new developments.

A few years ago, a good maintenance man could keep most equipment and machines operating without any specialized training. But he learned in the trial-and-error school of training—and experience is a slow, high-salaried teacher. Today maintenance men don't have time to learn by the trial-and-error method. In the past we thought of maintenance work as a "trade." But this has changed. The new maintenance man is a technician. And his experience must be supplemented with planned training programs.

PLANNING A PROGRAM

When you plan a training program, set your sights high—high enough so that you'll probably never reach your goal. If you train for minimum requirements, that's exactly what you'll get.

It's much more complex to train the mind than to train the hands. The most important aspect of training people for maintenance skills is that effective technical training demands good men to train.

Where do you find them?

- You can train your own people if they can possibly absorb the necessary data.
- You can hire people with basic electronic, hydraulic, or mechanical training and train them to handle your maintenance problems.
- You may find some potential technicians already working for you.
- You can help maintenance men who are willing students to train themselves on their own time. They can make good technicians.
- You can get help from local vocational and technical schools.
- You can provide a training program for after-work hours on such subjects as basic electricity, electronics, or others for which there is a need. You would pay your training personnel to instruct these programs on their own time.

If it comes to a choice between your present employees and newly hired people requiring less training, you'll be better off training your present people if they can be trained for the new job, because they have had experience in your plant. The selection of a man for a specific job should be based on a careful consideration of the job and the person. It doesn't pay to use mass placement techniques in filling the specialized jobs in your plant. Of course, you should establish prerequisites through the mass-testing procedure.

GETTING GOOD TRAINERS

Where do you start? You get the proper training personnel. You work with people, not with tools and machines. Therefore, you can't expect the best results if you simply take a man who knows a certain job or skill and make a training man of him. He has to have more than knowledge of a skill or process. To sell himself, an instructor must be sincere and patient.

What are the requirements for a maintenance trainer for an average mill, with the usual production-training problems, the usual maintenance problems, plus automated machinery and specialized quality-control equipment? This company should have three training people: a training coordinator and planner, a technical instructor, and a skills instructor.

The coordinator—He should sit in on all staff meetings to determine whether or not training is the solution to production problems. He should keep records on each employee showing past training, work history, test scores that indicate potential for new types of work, and recommendations for training and promotion. He should recommend and develop training programs, interview prospective new employees, and work with the employment organizations to develop placement tests. He should be responsible for providing a trainer whenever training is required.

The technical instructor — He should be able to communicate. He must have certain characteristics that some people can't acquire no matter how hard they try. He should have a broad background of training and experience in several technical fields—electronics, mechanics, and the like. Specialization is good when you want a service man, but technical instructors may have to teach maintenance of electronically controlled machinery today and a hydraulically operated press tomorrow. In a word, your

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From a paper presented before the 2nd Southeastern Plant Engineering Seminar by G. L. Howard, Instruction Supervisor, Lockheed Aircraft Corp., Marietta, Ga.

man must be a versatile technical instructor.

The skills instructor—He should be the rare sort who can do an outstanding job on anything from welding, soldering and riveting to rewinding an electric motor. He must be able to show and do.

TEACHING METHODS

To teach maintenance skill, you must have a plan, a goal, and a course outline that will carry you all the way to your goal. You must also know the background of the people in training, and you must develop training aids and literature to help you gain your objective in a minimum of hours.

There are three possible methods of instruction: classroom, on-the-job, or a combination of the two. The combination method is the best for most types of technical training in maintenance.

In the classroom, the basics are reviewed, discussed and sometimes learned outright—such as safety, special design features, operation and function. Once the trainee has a thorough grasp of the principles of operation, he should be assigned to work on the equipment under the guidance of the instructor. During this time the instructor can do a double job if he is made responsible for maintenance of the equipment.

The next step is to break down the equipment and go into details. However, if you can't break down the equipment, then use pictures and slides of the breakdown. If electrical or electronic circuits are involved, cover the schematic diagrams thoroughly. The trainee should identify each symbol with its part and function.

The best source of information on new equipment is the manufacturer. Some manufacturers are better prepared to provide training information and materials than others. But most of them anticipate this need and are eager to help you find what you are looking for.

Training aids are a big help in any maintenance course. Almost anything an instructor uses to help get a point across could be called a training aid—but never use one as a crutch. You can't offset inadequate material with pretty training aids. They can and should be used to stimulate interest, but their main purpose is to assist the instructor in teaching.

There are many types of training aids: slides, transparencies for an overhead projector, movies, animated trainers, functional trainers, cut-aways, and equipment or machinery. For basic training, movies are excellent. But the best training aid you can use is the equipment—if it is available.

Some companies have settled on overhead projector transparencies. And there are several good reasons for this choice. They are inexpensive—a good transparency in color can be made for about 30¢ plus art work. Another reason: The overhead projector can be used in a fully lighted room. Students can takes notes and will stay awake and the instructor can observe reactions. You can use a grease pencil to add information to a transparency, and you can erase it simply by rubbing it with a cloth. For example, your instructor might use transparencies of wiring diagrams for an entire system and trace out parts of the circuit while the trainee color-codes a paper copy. This system allows the instructor to emphasize the circuit components as he desires, and the trainee ends up with a color-coded copy be made himself during the training period.

SHOOTING FOR TROUBLE

In maintaining complex automated machinery, the technician must develop a system of logic for trouble shooting. He begins to develop this system during his training period. His job experience adds to the system. Most technicians develop their own plan—one that suits their experience. But it is up to the trainer to see that trainees learn the basic theories of trouble-shooting techniques.

The ground rules are simple: You must know the equipment you are maintaining and use your senses to gather the facts and come to a logical solution. You can spot most troubles with the eyes, ears, or touch. When you can't detect troubles this way, then you extend your senses with instruments and test equipment.

The technician who looks as if he is working hard may actually be getting the least amount of work done. Instead of thinking his problem out and arriving at a logical solution, he is frantically snatching components and replacing them, in hope that he will luckily find the bad unit before he has completely rebuilt the equipment. In some instances, if he changes many parts he will put in more trouble than he takes out.

A good trouble-shooting technician will usually spend most of his time studying blueprints and schematic diagrams—and thinking. Occasionally he will make a check on the equipment for factual information. Soon he establishes that the trouble is caused by one of three or four possible components. He then checks the parts, starting with the one he figures is most likely to be **defective.**

FINALLY—TEST RESULTS

You must have tests to measure results—written, oral, or a combination. Tests should be carefully prepared with one prime criterion: that they test for the knowledge or skill required on the job. Tests that ask for inconsequential information are self-defeating.

The purposes of a test are . . .

. . . *to inform the trainee* and the instructor about the progress being made.

. . . *to point out weaknesses* in instruction.

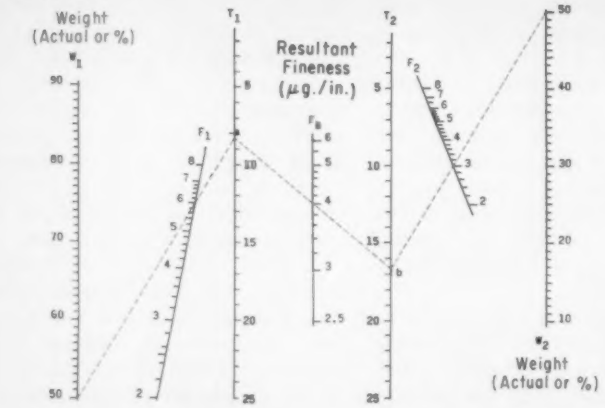
. . . *to insure* that a trainee who fails to acquire minimum efficiency is not accepted as qualified just because he has taken the maintenance training program.

. . . *to provide a record* to be analyzed and used in improving future training programs.

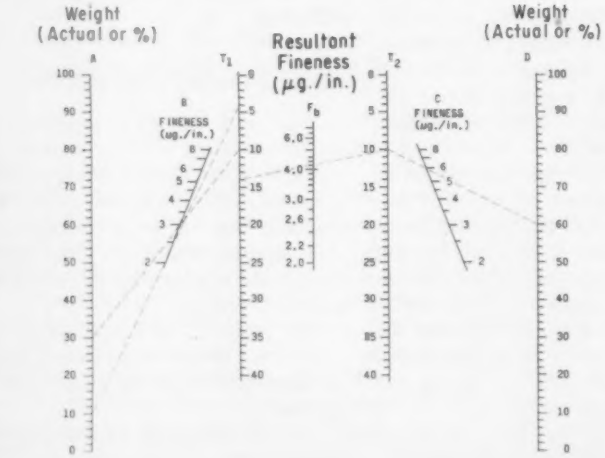
During the training program there should be several interim tests, covering the subject of each phase of the course and given after each phase is completed. A final test should cover the entire subject. All tests should include as much practical work as possible.

When you complete the program, follow up. Check on the people you trained—they may have questions. This follow-up will also give you a chance to evaluate the program. Only a few people learn more than half of what they are capable of learning. What you need is more and better training.

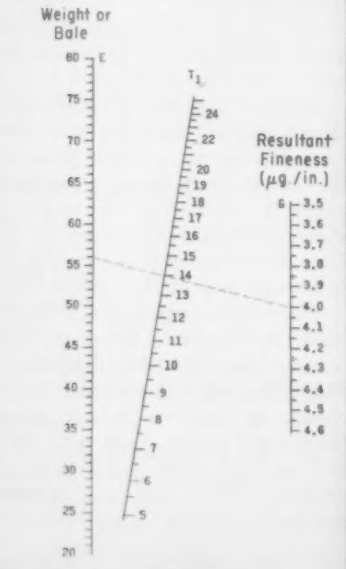
NOMOGRAPH 1



NOMOGRAPH 2



NOMOGRAPH 3



NOMOGRAPH 1 is based on two fiber-fineness components in terms of percentage by weight.

NOMOGRAPH 2 is based on two or more fiber-fineness components in terms of percentage by weight.

NOMOGRAPH 3 is used with either No. 1 or No. 2 in dealing with actual weights or bales.

Short Cut to

Throw away those complicated formulas for figuring fineness in cotton blends. The nomographs on this page will eliminate the need for mathematics.

IF YOU FIND it hard to calculate the fineness of a cotton blend by mathematical procedures, take a look at the nomographs at left. They'll help you determine blend fineness in a hurry—and without any complicated figuring.

The three nomographs are based on cotton by weight (actual weight or percentage). Nomograph 1 deals with a cotton blend having two cotton-fineness components. Nomograph 2 is an extension of Nomograph 1. It covers the use of more than two cotton components based on percentage by weight. Nomograph 3 is an auxiliary nomograph to 1 and 2. It's used for determining resultant fineness based on weight of cotton or number of bales blended.

HOW TO USE NOMOGRAPHS

Here are some specific case studies that will show you how to use one or more of the nomographs to solve a problem:

By GAIN L. LOUIS and LOUIS A. FIORI, Southern Regional Research Laboratory, U. S. Department of Agriculture; and H. G. LEWIS and S. C. MAYNE JR., Anderson, Clayton & Co., Houston.

Better Blending for Cotton

CASE 1—NOMOGRAPH 1

Problem: Find the resultant fineness of a blend with the following requirements:

a. 50% of 6 μg./in. cotton.
b. 50% of 3 μg./in. cotton.

Directions

1. Join the 50% point on scale W_1 with 6 μg./in. on scale F_1. Extend the line until it intersects reference T_1 at point *a*.

2. Join the 50% point on scale W_2 with 3 μg./in. on scale F_2. Extend the line until it intersects line T_2 at point *b*.

3. Draw a line connecting points *a* and *b* and read 4.0 μg./in. where the line crosses F_b.

Answer: Fineness of the blend is 4.0 μg./in.

CASE 2—NOMOGRAPH 1

Problem: Determine the fineness of one of the two components with one fineness component known and the fineness of the resultant blend predetermined as follows:

a. 50% of 3μg./in. cotton.
b. Resultant blend fineness of 4.0 μg./in.

Directions

1. Join the 50% point on scale W_2 with 3μg./in. on scale F_2 with a line. Now extend that line until it intersects the reference line T_2 at point *b*.

2. Join point *b* and 4 μg./in. on scale F_b. Now extend this line until it intersects the reference line T_1 at point *a*.

3. Draw a line joining point *a* and the 50% point on scale W_1. Read 6 μg./in. where the line crosses F_1.

Answer: Fineness of the component cotton is 6 μg./in.

CASE 3—NOMOGRAPH 2

Problem: Find the resultant fineness of a blend involving three fineness components based on these percentages by weight:

a. 10% of 2.5 μg./in. cotton.
b. 30% of 3.0 μg./in. cotton.
c. 60% of 6.0 μg./in. cotton.

Directions

1. Join the 10% point on scale A with 2.5 μg./in. on scale B. Extend the line until it intersects scale T_1. Record the value 4.

2. Join the 30% point on scale A with 3.0 μg./in. on scale B. Extend the line until it intersects scale T_1. Record the value 10.

3. Add these recordings (4 + 10) and mark the resultant value (14) on the T_1 scale.

4. Join the 60% point on scale D with 6.0 μg./in. on scale C. Extend the line until it intersects scale T_2. Read the value 10.

5. Draw a line connecting resultant value 14 on the T_1 scale and 10 on the T_2 scale. Read 4.2 μg./in. where the line crosses the F_b scale.

Answer: Fineness of the cotton blend is 4.2 μg./in. You follow a similar procedure when dealing with more than three fineness components of cotton.

CASE 4—NOMOGRAPH 3

Problem: Find the resultant fineness of a blend involving three or more fineness components based on number of bales (or actual weight) as follows:

a. 24 bales of 3 μg./in. cotton.
b. 20 bales of 5 μg./in. cotton.
c. 12 bales of 6 μg./in. cotton.

Directions

1. In Nomograph 1, join point 24 on scale W_2 with 3.0 μg./in. on scale F_2. Extend the line until it intersects scale T_2. Record the value 8.

2. In Nomograph 1, join point 20 on scale W_2 with 5 μg./in. on scale F_2. Extend the line until it intersects scale T_2. Record the value 4.

3. In Nomograph 1, join point 12 on scale W_2 with 6 μg./in. on scale F_2. Extend the line until it intersects scale T_2. Record the value 2.

4. Add these recordings (8 + 4 + 2) and mark the resultant value (14) on scale T_1 on Nomograph 3.

5. Add the number of bales used (24 + 20 + 12 = 56 bales) and mark the sum (56) on the E scale in Nomograph 3.

6. In Nomograph 3, join point 56 on the E scale with point 14 on the T_1 scale. Extend the line until it intersects the G scale. Read the value 4.

Answer: Fineness of the blend is 4.0 μg./in.

When the number of bales with a given fineness exceeds 50, use scales W_1 and T_1 or scales A and T_1 on Nomograph 2 instead of 1. Reason: Scale W_1 is calibrated from 50 to 90 and scale A is calibrated all the way from 0 to 100.

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1. Berkley, E. E., and Mayne, S. C., Jr., TEXTILE WORLD, Vol. 110 (1960), No. 8, pp. 49-51.
2. Croxton, F. E., and Cowden, D. J., *Applied General Statistics*, pp. 225-230, Prentice-Hall, New York, 1955.
3. Jennings, E. J., and Lewis, H. G., *Textile Research Journal*, Vol. 25 (1955), pp. 267-269.

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72 CIRCLE 72 ON READER SERVICE CARD

How to Cope With Familiarity

If results among your employees indicate that familiarity is breeding contempt of quality, safety, efficiency, and good housekeeping, you'll be able to use these tips on how to deal with them.

"I'M QUITTING, Frank. Friday."

"What? You, Tommy? What do you mean? Why, you're one of the best men I've got!"

"Yeah, I know that. But I'll tell you the truth, Frank. It's just not fun any more. It's all too familiar, the same old stuff day after day. Oh, you're a good boss. But I've had too much of the same. I'm going to get a job that has new things to it."

"Why didn't you tell me you were getting to feel that way, Tommy? You're a good man. I'll find something to give you some challenge. I don't want to lose you."

"No, Frank. I'm going. Once you get to feeling this way, it's no good staying, even with some changes."

A MIXED BLESSING

Frank's loss of a valued employee illustrates only one of several ways in which familiarity breeds trouble for supervisors. A recent conference of foremen points this out.

One participant said: "A foreman's first responsibility is to see that every one of his people knows his job. I've been training a new fellow. I'll work with him for weeks or even months. When I can walk away from him saying to myself, 'Now he's familiar with every aspect of his work,' I've done the most important part of my job."

"You're right, John," a fellow participant broke in, "except for one thing. That's the point when you have to start all over again. You can't walk away from your man for long, because you have to begin figuring how you can keep that *good* familiarity from becoming *bad* familiarity."

"I don't get it, Max. What's 'bad' familiarity?"

"Well, only yesterday there was a case. In fact, I was the guilty party. I told Fred Werkle to go get me some 318. Fred just stood there and looked at me, so I blasted him for standing around and acting dumb. Then he grinned at me patiently and asked what 318 was.

"I apologized. I felt like a damned fool. I was so familiar with the numbers we use, I took it for granted everyone else was, too, even a transfer like Fred."

Everyone of us can remember a teacher during our school days who suffered from the affliction of familiarity. It could be the old chemistry professor who knew so much chemistry he couldn't imagine that his students knew so little. Consequently, he'd go rambling off into what for him was a well-trodden path but what for the students was an impassable jungle.

Perhaps it didn't matter too much. All that happened was that his students didn't learn much chemistry. But when you're training a man to do a job, it matters a great deal. Slide over the guard on a cutting tool, for instance. You've known it so long, you assume everyone knows you never operate a cutting tool without a guard in place. So you mention it casually, or not at all, and there's an accident. The problem? Familiarity—your familiarity.

GETTING CARELESS

One of the most frequent familiarity follies is carelessness. Let a smart new man look around his first time on the job, and he's likely to say, "Where do I get my safety glasses and my safety shoes?" But a few months later, he's at work, his glasses are sitting on a bureau, and his shoes are in a closet at home.

Men who served on the fighting fronts can recall how accustomed they got to the bullets and shells. Few, fortunately, got so familiar with them that they became foolhardy, for they were flirting with death. People don't think about places like textile mills as death traps, and they certainly shouldn't. But a permanent injury, loss of a finger, a toe, an eye, should scare us enough to keep us constantly alert.

DECLINING VALUES

Remember the last time you bought a new car? For the first few months you probably kept it washed and waxed, shining like a Christmas tree. Then, almost imperceptively, it became more familiar—and more neglected. Oh, you kept it greased and changed the oil on schedule—maybe all through the year. But the shine was not so steady.

The same thing takes place in the shop. Say, you make the highest quality fabric of its kind in the world. At first, people are proud to be working on such material. They hate to use a piece of scrap as a wipe rag because it's such nice stuff. But it isn't too long before they are treating your prize bolts as if they were unbleached muslin.

A friend recently bought an original oil painting. For quite some time he hurried all comers into the living room so that they could see and admire the work. Shortly, however, visitors had to ask about the picture, and in a year the owner was suggesting that he made a mistake in the purchase.

This process of lowered estima-

By S. G. WILLIAMS
Management Consultant
New York City

tion of value because of familiarity takes place in the office concerning expensive machines and tools and office equipment.

LIVING WITH DANGER

A plant in Michigan had an almost new floor that buckled, creating a hazardous condition for workers and rolling equipment. At first there was great excitement. The union threatened all kinds of dire action. People complained frequently and at length. And maintenance promised to try to find out some way to correct the situation. But all met with little success.

A few people stubbed their toes. A couple of small loads tipped over. But there were no major catastrophes. People began to forget about the floor. On our last visit to the plant, we'd swear we were alone in even noticing that the floor was still buckled. Others were used to it, and accepted it. But it was still an unsafe condition that needed correction, and no one was doing anything about it.

KNOWING IT ALL

Perhaps the costliest of all familiarity follies is the too-human tendency to believe we know all about a subject—when, in truth, we know very, very little. This human failing is about the best ear, eye, and mind plug around. And most of us are guilty.

Dramatic example of this know-it-all folly is this brief conversation: "I'm going down to hear that talk tonight about how to organize a production department, Chuck. Would you like to come along?"

"Naw. Thanks, anyway. But I know about that stuff. I read a book about it once."

This practice not only trims work efficiency, it also deprives people's whole lives of enrichment and depth. With new discoveries happening faster than ever, with millions of dollars a month going into intelligent and succesful research, we still nibble a bit and think we've digested the whole cheese.

For instance, take the topic of this "Pointer." We've no doubt looked at only a small fraction of the troubles familiarity causes a supervisor. There's danger that, when we've finished the article, we'll feel we know the whole story. But the whole story, different for each of us, will be written only in our constant daily observation of how familiarity gets in the way of our being as good a supervisor as we can be. Incidentally, what *have* we noted here?

SIX COMMON DANGERS

We've seen half-a-dozen familiar ways that familiarity can foul us. Let's look at them again and ask how we can assume control so it will stop happening to us:

1. Familiarity can make jobs unbearably dull, cause us to lose people we'd like to keep. This is a challenge to do what a good supervisor always ought to be doing anyway. That is, to know how each of our people is feeling and thinking and, every bit as important, to provide each of them with opportunities to grow, to develop. This is a by-product, a vital by-product, of constant training efforts.

2. Familiarity can considerably reduce the sharpness of our job training, producing some pretty uninformed workers. A written checklist is a good control device for keeping us aware of the training points that must be carefully covered, however old they may seem. In addition, the same checklist given to an employee can speed his learning.

If you don't like checklists, try doing the job training with someone else. Two of you will check one another and, quite humanly, you'll both probably be trying to make more points than the other one.

3. Your people get familiar with dangerous conditions and grow mental callouses. You can handle this problem by picking one of your people and giving him the extra job of "being responsible" for everyone's observance of the safety rules. Change the assignment often, so fresh eyes are continually on the alert to prevent carelessness due to familiarity. And use the facts about familiarity as a major argument for the importance of this assignment.

4. Valuable things become commonplace as they become familiar. You have several weapons for combatting this phenomenon. One is setting an example. Perhaps you know from experience that if you continue to keep your car washed and polished, just about every other car in the parking lot near you gets bathed and burnished more often—not only the cars of your own people, but those of people in other departments, too. If you practice sticking the blade of your jackknife in the top of your desk, you can confidently expect employees to care little about preserving the gloss—and the efficiency—of the machines they work with.

Another weapon is departmental policy—again dependent on how you, the boss, hold to it. You've seen sections where maintenance and housekeeping were always kept up to snuff, others where they never were. If the supervisor insists, it happens. If he doesn't, such practices immediately start downhill. You can use pride the same way. Brag a little about how your employees keep the department shining. Talk about how pleasant it is to have nice things to work with, nicely kept.

Housekeeping contests, prizes for the best sectional maintenance record, and similar devices are ideas that you can suggest to the personnel department.

5. You become so familiar with threatening or unsafe conditions that you lose your sharpness. What you need is a checklist. Read the list over every week, at the same time each week. Don't let the list get stuck in a drawer or under a pile of books. Some supervisors tape it up at eye level over their desk, so every time they sit down it's staring right at them. But be careful: Even that list can become so familiar that you'll no longer see it!

6. "A little knowledge," as they say, "is a dangerous thing." Letting a young fellow at a complicated machine because he's "seen the others run it" is a good way to build up an expensive repair—and maybe hospital—bill. But the real problem person, in terms of thinking we know more than we do, is ourself. You do know a lot about a lot of things, or you wouldn't be a supervisor. But there's more to know—much, much more. And you're never in all your life going to know all there is to know.

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CHEMICAL TREATMENT AND FINISHING

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KNITWEAR FASHIONS

GDC DYES FOR ACRYLICS

tailored to fit the requirements of fiber, fabric, and wearer

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Genacryl,® Celliton,® Supralan,® Palatine®—remember these names for acrylic-fiber dyeing, for good fiber affinity in a broad range of bright, well-penetrated, level and economical fashion shades dyed by simple methods.

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IN CANADA: CHEMICAL DEVELOPMENTS OF CANADA, LTD., MONTREAL

News of the Month in . . .

Textile Chemicals

By ROBERT W. PINAULT, Associate Editor, TEXTILE WORLD

New Techniques Now Revealed To Speed Wool Bleaching

Researchers at Becco Chemical Div. have come up with three ideas that look like time savers for wool bleachers. B. K. Easton, manager of Textile Applications at Becco's Chemical Research & Development Center, offers these tips:

1. Add a steaming step to the conventional dry-in bleaching method. Use 2 to 4% of 35% H_2O_2 in the last bowl of the scouring train, squeeze out, and lead the loose wool into a J-box or a closed conveyor.

Steam the wool for 2 minutes, then put it through the usual drying process. Result: raw wool stock almost as white as that treated in a 3-volume immersion bleach that takes 2½ hours. And alkali solubility is lower. You'll find the method especially suitable when you are going to blend the wool with man-made fibers.

2. Take a new look at cold bleaching, which isn't as popular now as it once was. You can get adequate whiteness for blending purposes by saturating the stock in a 4- to 6-vol. bath of H_2O_2 that includes 5 pounds per 100 gallons tetrasodium pyrophosphate, 3 pounds per 100 gallons ammonia, and a nonionic detergent. After the stock lies for about 6 hours, complete the process with a light scour.

3. Speed heating of bleach baths. If you raise the temperature of the bleach bath rapidly, then hold it at 160 to 185 F. for 15 minutes, you'll get an equivalent effect to a 2½-hr. bleach at 125 F. For this system, use a 3-vol. H_2O_2 bath that also contains 2 pounds of hexametaphosphate and 1 pound of sodium bicarbonate per 100 gallons. It's important to get the bath up to temperature as fast as possible.

Alkali solubility of wool treated this way is only a few percentage points higher than for conventionally bleached wool.

New Starch Ethers Work with Reactive Dyes

Chemists now come up with new water-soluble starch ethers that are excellent thickeners and combine with reactive dyes only slightly.

Typical is a series of starch carboxymethyl ethers that carries varying amounts of carboxymethyl (COM) groups. Range is from 0.31 to 0.90 COM groups per starch molecule. Lower-substituted starches give less viscous pastes.

These ethers are water soluble and are free of primary alcohol groups. You can get excellent printing results with such products. Comparison of prints made with the starch ethers and ones made with alginates indicates that better color value and sharper outlines are possible with the starch ethers.

Why is all this important? Printers have found that ordinary starch thickeners take a heavy toll of color if they're used with reactive dyes. Primary reason: Dyes combine with the starch to form a dye-starch-ether compound. This reaction eats up color. The dye-starch-ether compound is insoluble in water and thus doesn't wash out in normal soaping. Fabrics thus are apt to be harsh and boardy.

Reactive dyes don't give this effect with aliginate-based thickeners. Reason: Alginates react differently from starch. There are primary alcohol groups in both starch and cellulose. But although aliginates have two secondary alcohol groups, they are much less reactive.

New Crosslinker Offers Good Wash-Wear Effects

A substituted triazin-4-one is the base of wash-and-wear finishes recently developed by Sun Chemical Co. It won't form a resin in the fiber, and it gives a soft hand. As little as 3% gives excellent crease resistance. Good tear strength and abrasion resistance are claimed. Also there's little tendency to develop odor in storage or absorb chlorine during laundering.

Here's the general formula:

$R - N - CH_2 - N (CH_2OH) - CO - N (CH_2OH) - CH_2$

R is an alkyl group present in the primary amine $R\text{-}NH_2$ used in preparing the compound.

You make the substituted triazin-4-one by reacting at 10 to 20 C. one mole of a primary amine such as monethylamine, n-propylamine cyclo-hexylamine, benzylamine, or n-butylamine with one mole of urea and two moles of formaldehyde. Then you react this intermediate with two moles of formaldehyde to form 1-substituted-3:5-dimethylol-2:6-dihydro-triazin-4-one.

Tartaric Acid Is Secret Of Super-White Yarns

Add a small amount of tartaric acid to bleached rayon yarn. It will overcome the slight yellowing that usually persists after using chlorine bleach. The tartaric acid is the secret of American Enka Corp.'s U. S. Patent 2,922,728.

The company adds the acid at final yarn lubrication. It treats the yarn (while it is in cake form under pressure) with a lubricating liquor that carries 2% of a mineral-oil emulsion plus 0.045 to 0.055% of tartaric acid. After hydroextracting, it dries the yarn at 78 C. in a vacuum chamber.

Plasticizing Flock Will Give You Printed Patterned Effects

Heberlein & Co. A. G. has developed a method of decorating flocked fabrics by plasticizing the pile in a printed pattern.

According to the type of flock, the company uses various chemicals to cause the flock to become partially dissolved. In the areas affected, the flock acquires a homogeneous flat surface, contrasting sharply with the untreated flock.

For rayon flock attached to cotton, with rubber adhesive, you can use the following:

Zinc chloride	69 parts
Water	31 parts
Viscose waste	2 parts

Heat the printed fabric to 90 C., then wash thoroughly.

For a rayon flock on rayon fabric when the adhesive is based on polyvinyl chloride, you can use:

Calcium thiocyanate	850 parts
Water	125 parts
Viscose waste	25 parts

Dry at 120 C. and afterwash.

Other chemicals you can use on cellulosic flocks include mineral acids, ammonia, benzyltrimethylammonium hydroxide, or caustic alkali. Acetone and dioxane are used for acetate flocks. Phenols and organic acids work well on nylon-fiber flocks. Sulfuric acid is suggested for polyester flocks, and dimethylformanide or dimethylsulfoxide is suggested for acrylic fibers. More details are available from British Patent 816,356 to Heberlein.

Acid Peroxide Process Solves Color Problems

A new peroxide bleaching system developed by Becco Chemical Div. can be used with striped or multicolored fabrics. The solution is a mildly acidic H_2O_2 composition that is not corrosive to stainless-steel equipment at normal processing temperatures.

Naphthol reds and blacks and vat dyes sensitive to conventional peroxide bleaching are unaffected by the acid-peroxide system.

You can use the usual cotton-bleaching J-box equipment and saturators with little or no change. You can also use jigs and becks. Catalytic damage to the fabric is greatly minimized, and an excellent bottom for dyeing is produced.

Polyphosphate Additive Protects Nylon from Sunlight

Traces of manganese salts are effective in preventing the degradation of delustered nylon by sunlight. But simple salts, such as acetates, may themselves break down to form the brown oxide of manganese.

To solve this problem, Vereinigte Glanzstoff-Fabriken A. G. uses a polyphosphate complex produced by reacting a manganese (or cobalt, nickel, copper, or chromium) salt with an alkali metal polyphosphate or polymetaphosphate. The polyphosphate complex can be added to the ingredients of the nylon mix or directly to the melt.

After 265 hours' exposure to a Phillips fluorescent tube, untreated nylon may lose up to 60.5% of its strength. Nylon with as little as 2.0×10^{-20}% manganese loses only 3.1% strength in this way.

Will Study Soiling of Finished Cottons

How do finishes for cotton affect soiling and removal of soil from fabrics? This question will be tackled by Harris Research Labs., Washington, D. C., under a contract signed with Southern Utilization Research and Development Div., New Orleans, La.

The studies will attempt to establish the relationship between physical-chemical surface properties and soiling characteristics of cottons treated with selected finishing agents. Various types of coatings including latex, silicone, and fluorocarbon compounds will be investigated. Researchers hope the information developed can be used to formulate specific finishing agents to improve soil resistance of cotton and facilitate soil removal.

Thiourea Resins Make Nylon Flameproof

Thiourea - formaldehyde resin does a much better job of flameproofing nylon nets and laces than melamine-formaldehyde resin, according to American Cyanamid Co. (U. S. Patent 2,922,726).

Problem is to prepare a thiourea-formaldehyde resin that won't precipitate before it can be used. Cyanamid solves this problem by esterifying the precondensate with a lower aliphatic alcohol, such as methyl alcohol, and by using special catalysts.

Suitable catalysts may be halide salts of amines and alkylolamines or the hydrobromides of isopropylamine or a 2-methyl-2-aminopropylamine. To avoid tendering, not over 3½% of the catalyst (calculated on the resin) should be used.

Application is by normal pad, dry, cure, and afterwash procedures.

Durable Flameproofing, Soft Hand Result from Complex Phosphates

You can get durable flameproofing from polymeric phosphonitrilic chlorides, according to British Patent 865,396 to Compagnie Francaise des Matieres Colorantes, France.

Start manufacture of the material by refluxing 100 parts (0.48 mole) of phosphorous pentachloride, 22 parts (0.42 mole) of ammonium chloride with 320 parts of tetrachloroethane for 7 to 15 hours. Then add 400 parts of tetrachloroethane and cool the mix to 10 to 20 C. At this point lead in 35 parts (2.6 moles) of dry ammonia gas, which is absorbed by —and aminizes—the compound. Finally, distill off the tetrachloroethane and you'll come up with a soluble white powder. Yield is about 80 to 85 parts.

Use aqueous 20% solution of this product to pad onto cotton fabrics. Then dry fabrics at under 100 C. and cure them at 140 to 160 C. for 5 to 15 minutes. The treated fabric has a soft hand and is still flameproof after two 1-hr. launderings at the boil. It retains 88% of its original strength.

Chemical Process Burns Out Designs

You can decorate polyamide-fiber fabrics by printing on materials that dissolve the fabric locally. Here's how U. S. Patent 2,990,231 describes the process:

Print the goods with a paste containing an inert thickening agent and from 15 to 45% of a member of the guanidine and guanidine carbonate group. Or you can substitute 5 to 10% of thiodiglycol plus equal amounts of guanidine or carbonate. Another variation: Use 5 to 10% of o-phenylphenol along with the guanidine or guanidine carbonate group.

In all cases, heat the fabric to 100 to 220 C. until printed areas are completely destroyed.

Inorganic Salts Are Base for Wool Coloring

You can color protein-based fibers with sulfates and chlorates of copper, cobalt, and nickel, also with potassium bichromate, according to U. S. Patent 2,987,368.

First, treat the material in a hot aqueous bath that contains 2 to 12% (based on the weight of goods) of an inorganic acid, such as hydrochloric or sulfuric acid. Also include 0.5 to 8% of an organic acid, such as amino-naphthol-monosulfonic or amino-naphthol-disulfonic acid.

Set up a second treating bath with 0.5 to 3% of sodium nitrite.

Finally, treat the prepared fabric at 85 C. in a bath that contains the colored inorganic salts mentioned above.

"Substantially permanent" colors are the result of the process.

Did You Know . . .

. . . that shearling or calf skins with hair attached can be dyed at low temperatures with the aid of organic solvents? According to British Patent No. 872,506, chromed calf skins and chrome-tanned sheep skins can be much more deeply dyed at about 60 C. if the dyebath contains about 2 grams per liter of n-butyl alcohol, benzyl alcohol, amyl acetate, or thymol. The dyeing may be carried out with many types of dyes including acid chrome, neutral dyeing premetalized, milling, and dispersed dyes.

■

. . . that many products used to protect olefin film from sunlight (built-in when the film's made) are relatively useless when used for coating the surface of olefin or other man-made fibers. Reason: Much larger surface area of fibers defeats the effect of the screening agent. These materials work by preferential absorption. The screening agent rather than the film absorbs the ultraviolet rays.

■

. . . that visible light is the prime factor in fading of dyes not fast to sunlight? Both ultraviolet and visible light have effect on dyes up to a critical wavelength, beyond which no fading occurs. Dyes resistant to sunlight are finally faded by ultraviolet rather than visible light.

■

. . . that you can strip Procion dyes with hydrazine? A boiling 40%-hydrazine solution will leave Procion-dyed cotton nearly colorless. Procion-dyed cotton is insoluble in cuprammonium solutions, but stripped goods are completely soluble. The hydrazine treatment does not unduly degrade cellulosic fibers.

■

. . . that you can print unchlorinated wool with the help of formic acid? You can get good color value if you dissolve the wool dye in 90% formic acid, using Karachi gum or Cellofas B (Imperial Chemical Industries, Ltd.) as a thickener. The screen should be made of Dacron, blocked out by a rubber-bearing preparation. Afer two minutes wash and dry the wool.

What's New in Dyes and Chemicals

Nylon Dye

Supernylite Cerise BL . . . produces brilliant red-violet shades on nylon fibers. You also can apply the color on woolens and wool-nylon blends. Apply the dye with an acid salt or acetic acid. The color has good lightfastness, and washfastness can be improved by aftertreatment. Althouse Chemical Co., Div. **(Circle D-1 on Reader Service Card)**

Foam Deodorants

Urethane-Odor Masks . . . are offered in a series of three different scents for application to urethane foams. Two of the masking agents give the clean scent of freshly laundered linen to products such as foam mattresses, foam pillows, or foam-laminated fabrics used in apparel. The third agent neutralizes amine malodors. All three resist high temperatures. Noville Essential Oil Co. **(Circle D-2 on Reader Service Card)**

Foam Adhesive

Unithane Adhesive 200 . . . is a one-package product for lamination of polyurethane foam to fabric. The adhesive works by solvent evaporation. It leaves a tacky film that is cured when you heat the laminate at 250 F. for 15 minutes.

The product gives a high bond strength, is stable, and will not strike through the fabric. Initially it has high tackiness and is resistant to drycleaning. Thiokol Chemical Corp. **(Circle D-3 on Reader Service Card)**

Thickener

Nouraltex SS . . . is a sodium-alginate type thickener that dissolves rapidly in cold, warm, hard, or soft water with minimum agitation. In neutral soft water the alginate produces short-flow gels. In hard water the flow is very short. In the presence of meta- or polyphosphates, or another alkaline medium, the alginate has a long flow. Viscosity: about 800 cps. in a 1% solution. Edward Mendell Co., Inc. **(Circle D-4 on Reader Service Card)**

Reactive Dyes

Drimarene Golden Yellow Z-R, Drimarene Yellow Z-5, Drimarene Bordeaux Z-BL, and Drimarene Navy Z-2 RL . . . are all recommended for padding or printing. The colors have the characteristic brightness, washfastness, and the ease of afterwashing common to the Drimarene Z series. Sandoz, Inc. **(Circle D-5 on Reader Service Card)**

Cellulose Reactant

Aldocryl Resin X-12 . . . is suggested for shrinkproofing rayon and creaseproofing cotton. It is a non-nitrogenous acrolein derivative that is not affected by laundry bleaching methods.

Reactivity with starch, protein substances, and phenol indicates usefulness in starch-, leather-, and plastic-modification techniques. It's available in product-development quantities. Shell Chemical Co. **(Circle D-6 on Reader Service Card)**

Crosslinking Finish

Rhoplex HA-16 . . . has excellent durability to laundering and drycleaning, good emulsion stability, and high film strength. The resin is an acrylic copolymer, one of several similar compatible dispersions offered by the manufacturer. Suggested uses: a finish or a binder for nonwoven fabrics. Rohm & Haas Co. **(Circle D-7 on Reader Service Card)**

Resin Finishes

Onyxset A . . . is a colorless stable liquid that imparts shrinkage control and crease resistance to all types of cotton and rayon fabrics. It is recommended for dyed goods where nonretention of chlorine is unimportant. The resin is also suitable for the production of glazed or schreinered finishes.

Onyxset LC . . . is a cyclic-reactant resin in liquid form suitable for cottons that require crease-resistant finishes of low odor-forming potential and high scorch resistance. Onyx Chemical Corp. **(Circle D-8 on Reader Service Card)**

Wetting Agent

Nylon Wet 101 . . . is especially formulated for dyeing heavy filament-nylon rug materials. The product has exceptional wetting power and is helpful in keeping the goods submerged during the dyeing process. Moretex Chemical Products, Inc. **(Circle D-9 on Reader Service Card)**

Synthetic Latex

Chemigum 520 . . . is recommended as a binder for nonwoven fabrics. The product is classed as a medium nitrile latex. Goodyear Tire & Rubber Co., Chemical Div. **(Circle D-10 on Reader Service Card)**

Water-Repellent Base

Kemstrene Amide B . . . is offered as an improved stearamide in the C_{20}-C_{22} range. The product has improved color and color stability and produces durable water-repellent finishes when properly formulated. Humko Products, Chemical Div. **(Circle D-11 on Reader Service Card)**

Size Binder

Polyfilm B-2 . . . is a water-dilutable acrylic resin used as a binder for warp sizes based on starch. The product may be added to the mix at any stage of the cooking cycle. It works well with conventional or modified starches and is suitable for natural or man-made-fiber warps. Polymer Industries. **(Circle D-12 on Reader Service Card)**

To spin a rainbow . . . start with white. Modern bleaching techniques give textile makers pinpoint control over whiteness . . . enable yarns to be dyed uniformly in a whole spectrum of brilliant colors. Pennsalt has long supplied the textile industry with quality bleach chemicals—chlorine, sodium chlorate and hydrogen peroxide—as well as with a wide range of other chemicals, including caustic soda, potassium and ammonium persulphate, surfactants, amine and organosulfur intermediates, sal ammoniac and ferric chloride.

Call on Pennsalt Technical Service to find out how you may reduce costs and improve quality in your finishing operations. An experienced representative will study your process from greige goods to finished product and provide you with reliable solutions to your finishing problems. Industrial Chemicals Division, PENNSALT CHEMICALS CORPORATION, Three Penn Center, Philadelphia 2, Pa.

Pennsalt Chemicals
ESTABLISHED 1850

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PENNSALT INTERNATIONAL, PHILADELPHIA, PA.

New binder for starch warp size improves efficiency and finish

...for synthetic, natural and synthetic/natural fiber blends

POLYMER REPORT

POLYFILM B-2 improves adhesion, makes yarn stronger, more flexible.

POLYFILM B-2 is a water-dilutable solution of acrylic resin specially formulated to improve film strength, surface and adhesion of starch to synthetic and natural fibers.

Easy to use

POLYFILM B-2 improves conventional starches, modified starches and starch gums. It is added in amounts from 5 to 30% (of weight of dry starch) at any point in the cooking cycle. Disperses quickly, completely . . . without lumps. Gives *uniform* size, day in and day out.

Effective on wide range of synthetic fibers and blends

Used for 100% acetate; acetate-viscose; 100% acrylic; acrylic with viscose, wool, polyester or cotton; 100% polyester; polyester with cotton, viscose or wool; triacetate-viscose, etc.

For hard-to-size fibers producing hairy yarns, POLYFILM B-2 reduces clinging and shedding. Excellent for seersuckers, gabardines, twills, etc. requiring maximum flexibility.

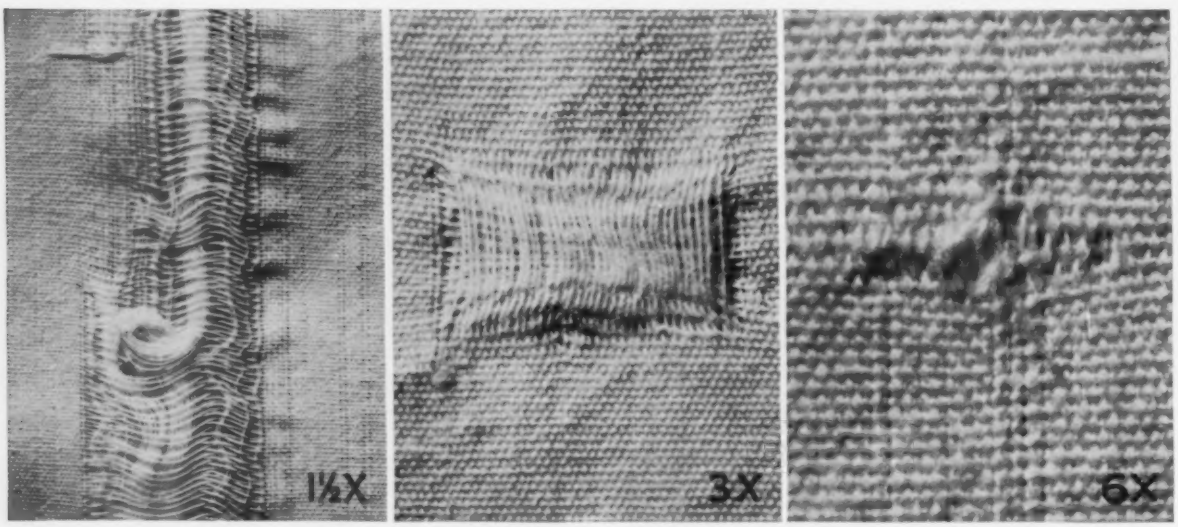
For mills running straight cotton as well as blends, POLYFILM B-2 has been run with starch on carded and combed yarns in counts from 7/1 to 60/1 for fabrics from Osnaburgs to lawns. Marked improvement in efficiency (2-3%) has been demonstrated.

Easily removed

POLYFILM B-2 is quickly removed by conventional boil-off desizing including enzmye baths . . . *even when fabric is heat-set for 2 minutes at 400°F.* Size can be cleaned from equipment with hot *or* cold water.

Technical Service

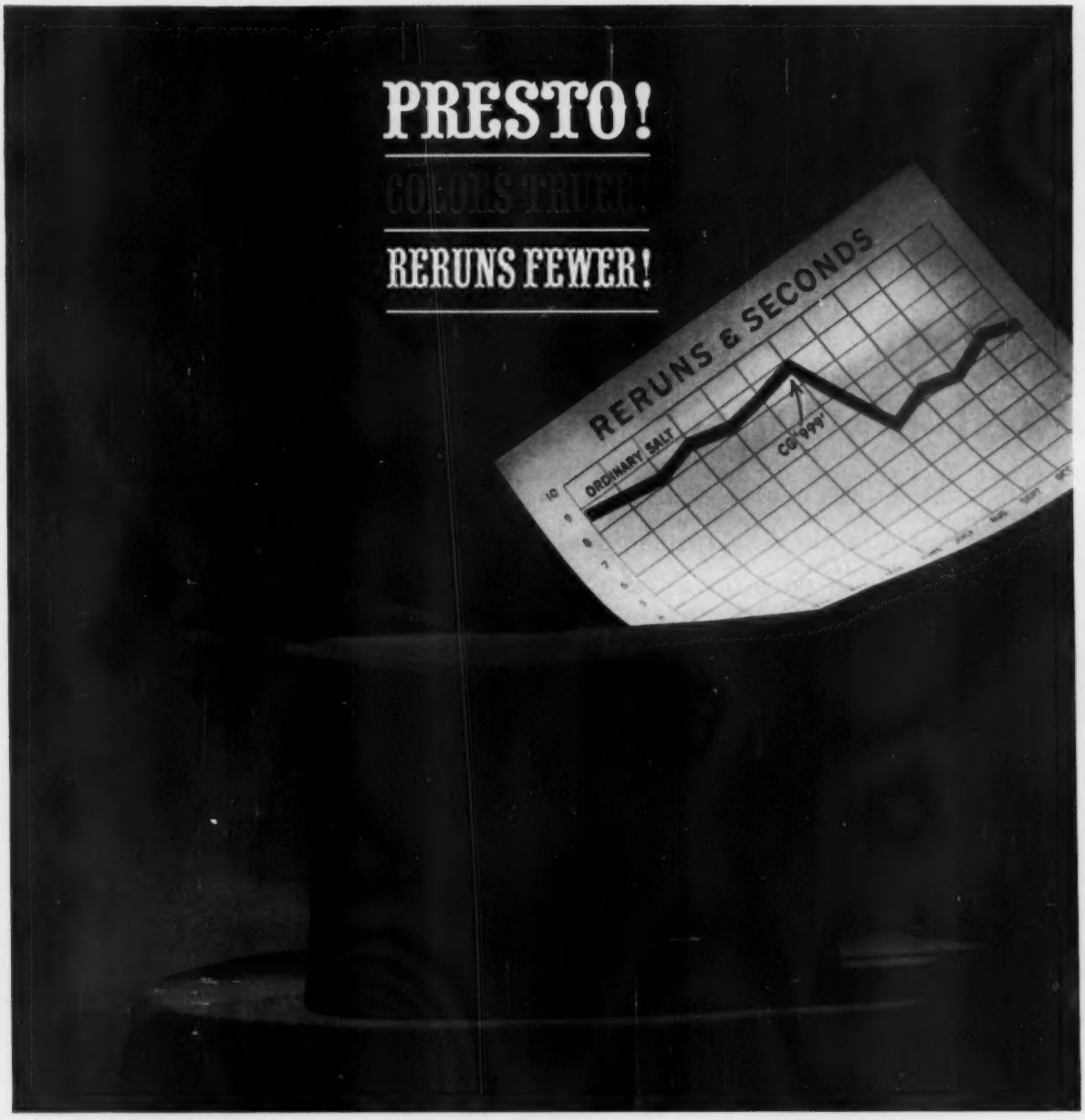
Polymer Industries' mill-trained textile chemists are available to help you with warp sizing and finishing problems. Call or write Polymer Southern Division, Dept. T8 Box 2184, Greenville, S. C. or Polymer Industries, Inc. Dept. T8, Springdale, Conn.



Three types of weaving defects caused by "clinging" of warp ends. By adding POLYFILM B-2 to starch type warp sizes, a smoother warp is produced thereby reducing "clinging," "fluff balls," "floats" and many other misweaves.

Polymer Industries

Polymers, copolymers, natural and synthetic products for sizing, printing, stiffening, softening, coating and laminating. Plants at Springdale, Conn. and Greenville, S. C.



With Morton Chemical Grade '999' Salt

It's not magic . . . but sometimes the results you get when you switch to high purity Morton Chemical Grade '999' Salt seem almost magicall Colors are truer . . . exactly as the manufacturer intended them to be. And reruns and seconds often drop 50%—as shown by actual records.

With salt of average purity, calcium and magnesium compounds complex dyes and reduce their effectiveness. But with high purity Chemical Grade '999,' you get 99.95% pure sodium chloride with a trace of sodium sulphate—as recommended whenever commercial calcium-free salt is required.

When Cost Is the Determining Factor, Use Morton Purex Salt. Morton Purex Salt is the ideal salt for textile use when high purity is not essential. Purex is guaranteed to have a minimum purity of 99.5%, and to be 100% soluble. Like Chemical Grade '999,' and all other grades of Morton Salt, it is easily and quickly available anywhere in the U.S.

MORTON SALT COMPANY Industrial Div.
Dept. TW-8, 110 N. Wacker Drive, Chicago 6, Ill.

Please send me more information about

- ☐ *Morton Chemical Grade '999' Salt*
- ☐ *Morton Purex Salt*
- ☐ *I would like to talk to a Morton representative about other grades of salt used in the textile industry.*

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A TEXTILE WORLD UPDATE

What You Should Know About Vat Dyeing Today—Part 5

Here is Installment 5 of this helpful refresher series. It will bring you highlights of package dyeing for cotton, viscose, and wool, and will tell you about package preparation and the various ways to dye.

THE INITIAL preparation of cotton yarn for vat dyeing will depend on the type of cotton, the type and count of yarn, the specific dye formula, the dyeing temperature, and the end use of the yarn.

Lots of cotton yarn is vat dyed without initial wetting, scouring, or bleaching. When you can use this method, costs are lower and yarn is suitable for manufacturing.

If prewetting is needed to free entrapped air, use a good anionic wetting agent. Usually 0.10% on the weight of yarn is enough for low-temperature wetting out. At 120 to 160 F., 0.05% may be enough. Combination of wetting out and scouring is often done at 180 to 200 F. with 1 to 2% soda ash plus a detergent. To get good emulsification of cotton impurities, you must scour at 200 F. and add 2 to 4% of caustic soda to the bath.

To safeguard against oxycellulose forming, add 0.1% of sodium bisulfite to the scouring bath. Rinse with fresh hot water and let it overflow. This way, there's less danger of suspended matter coagulating and filtering out on the yarn.

By the late O. W. CLARK
Dyes Department
American Cyanamid Co.
Bound Brook, N. J.

Some types of cotton contain polyvalent metals that may form precipitates in a vat-dye bath. Alkaline scours do not remove metal impurities of this type. Treat such goods with a 1 to 2% solution of 56% acetic acid at 200 F. for 15 minutes, then rinse in a bath containing 0.1% of a good chelating agent.

Scouring agents, penetrants, leveling agents, and other chemicals used in any stage of vat dyeing should be checked for working properties under your working conditions. Some surfactants are not soluble above 180 F. and may gel out in the bath. Certain complex phosphates decompose at over 190 F. and coat the yarn with a white precipitate. For reasons like these, you should check out any product in the laboratory under the same conditions it will meet in the mill.

Yarn processed in packages is usually bleached with peroxide. The method is fast and relatively safe. A typical bleach bath will carry 1 to 4 gallons of 130-vol. hydrogen peroxide and ½ to 2 gallons of sodium silicate, or 3 to 8 pounds of sodium diphosphate per 100 gallons of bleach liquor.

Start bleaching at 120 F. and gradually raise the temperature to 195 to 200 F. Continue bleaching at this level for 1 to 2 hours, according to the type of yarn or the shade and bottom required.

Plants that boil and bleach yarn in large quantities often do so in open equipment separate from the dyeing machines. These machines usually have unidirectional liquor flow and operate without a cover.

HOW PIGMENT DYEING GOES

The most widely used method of vat dyeing yarn is to apply the dye in pigment form, circulating highly dispersed vat dyes through the packages in a dyebath that contains the necessary assistants but no caustic or hydro.

Circulate the dispersion only long enough to establish a homogeneous bath. (Prolonged circulation does not contribute to level dyeings. In fact, it may have the opposite effect because of aggregation or filtration.) Then add the reducing chemicals. Dyeing proceeds either at the same temperature used for pigmentation or in a cooling bath.

Temperature variations—These are fairly common. Each dyehouse develops its own temperature manipulations to suit its particular conditions. If dyeing is carried out

at higher than normal temperatures, exhaustion of dye is usually slower, so there is more unused dye in the bath for a longer period. Net result is better penetration of less accessible package areas. With high-reduction temperatures you also get lower bath viscosity, and you can use less caustic and hydro to get complete reduction. Also high temperature means greater dye migration, which helps with leveling.

High-temperature hazards—These include lower color value, instability of the leuco compound, and lower pump efficiency. But you can improve yields by adding large amounts of salt at proper intervals. And you can improve leuco stability by adding certain stabilizing chemicals. High temperatures have little effect on pump efficiency in closed systems.

Probably the best all-around method of getting the most out of high temperature is to add the caustic and hydro at the high temperature. Then let the bath cool after 20 minutes at 3 F. per minute until the normal dyeing temperature for the dye is reached. A variation of this method is to cool the bath before the caustic and hydro are added.

Another variation is to add sodium nitrite to the dyebath just before you add the caustic and hydro. Some dyers say you'll get better leuco stability with sodium nitrite than with dextrin, lignin sulfonate, or glucose. Sodium nitrite is specified in the Calcotherm method (patented by American Cyanamid Co.). It is particularly applicable to indanthrone vat blues and the halogenated pyranthrone vat oranges.

Gradual temperature rise—You may want to start pigmentation in a cold bath on dry yarn or previously wet-out yarn, as some dyers do. This method is especially good with plied yarns, viscose, or mercerized yarns. After a period of circulation, you can shut down the pump for periods of 5 to 10 minutes to let the packages relax and the liquor seep into the package.

Finally, add the reducing chemicals and warm the bath at 1 F. per minute up to 100 F., then more rapidly until it reaches normal dyeing temperature. You may have to go to 180 F. with some vat dyes to promote level dyeing.

Gains with pigment method—They are simplicity, speed, reproducibility, low labor cost, good penetration, and superior physical condition of the yarn.

Vat-acid, hydrolyzed-leuco, and soluble-vat methods can also be used to apply vat dyes to packaged yarn. They are of little importance in the United States today and are used only where normal pigment methods will not work. For a few words about them, read on.

NOW, REDUCED METHOD

With this method you reduce the vat dye in a stock vat. Prime the dyebath with suitable amounts of caustic, hydro, retarding agents, and sequestrants, and set the temperature for the type of dye used.

Usually, the stock vat is prepared by standard methods suggested by the dye manufacturer. This way you can make highly concentrated stock vats when dyeing dark shades. Be careful, though, to pretest such formulations in the laboratory for working qualities.

The highly concentrated stock vats are not as stable as the normal formulas. So you should use them within 10 to 15 minutes of their preparation. Put in the dyebath about one-fourth of the total amount of caustic and hydro that will be required to complete the reduction of the stock vat. Circulate this priming solution of caustic, hydro, and assistants through the yarn for 10 to 15 minutes before you add the stock vat.

The "strike" of vat dyes is swift at normal dyeing temperatures. So use a retarding agent to insure that dye is available to the more inaccessible areas of the package.

If salt is needed to provide a good color yield, add it in gradually increasing proportions. For example, you can add a total of 15% salt in portions of 1, 2, 4, and 8%. Highly refined common salt, free of nearly all calcium and magnesium, is best for vat dyeing.

Gradual temperature rise—Sometimes you can control the stock vat application method by starting at 65 to 70 F. and gradually—1 F. per minute to a temperature of about 100 F.—raising the temperature to 180 F. or over. Class I vat dyes respond well to this system. Their dyeing temperature of 120 to 140 F. is exceeded to such an extent that beneficial migration occurs at 180 F. The low starting temperature is most important because Class I dyes are fairly well exhausted by the time the bath has been heated to 100 F.

NEXT, VAT-ACID METHOD

For pale shades on mercerized plied yarns, to mention only one use, some dyers turn to the vat-acid method. They prepare the stock vat acid as previously described and circulate it through the yarn. Then they slowly add the reducing chemicals to convert the vat acid to the sodium-leuco compound.

The method is complicated and is used only where normal pigment or soluble-vat methods will not work. It is not practicable for heavy shades.

AND SOLUBLE-VAT METHOD

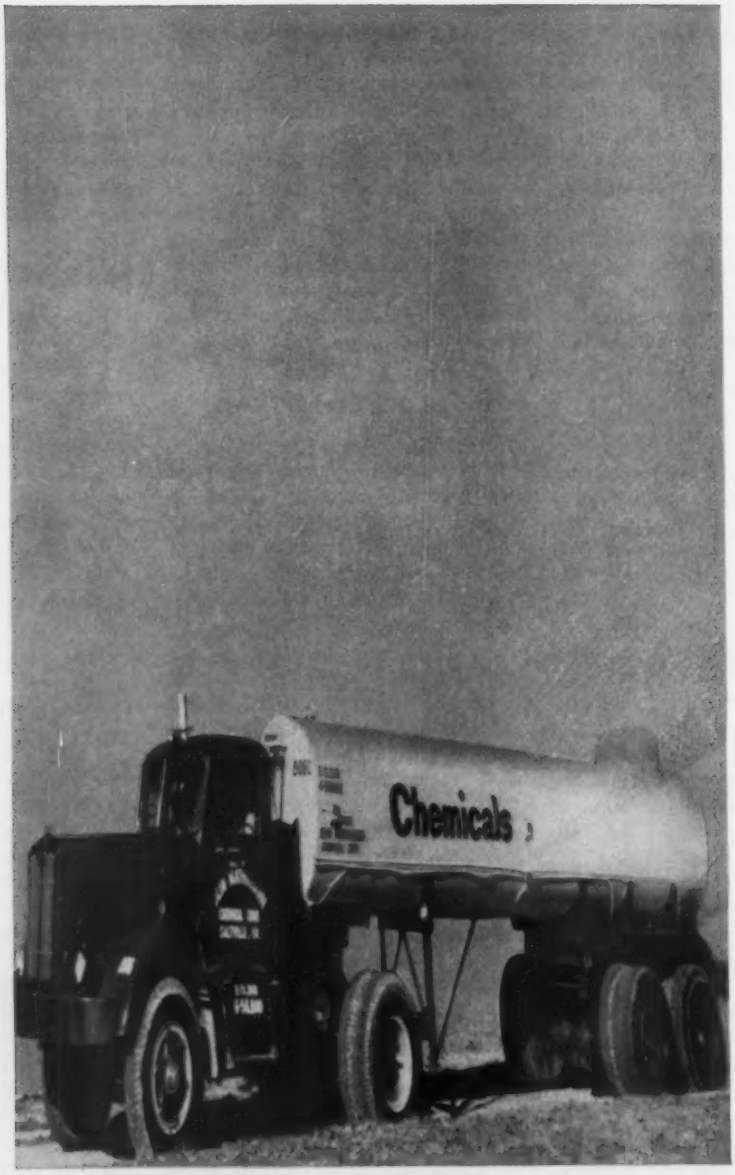
Soluble vats exhaust slowly, penetrate well, and give level dyeings, but they are expensive and so are used mainly for pale shades.

First, paste the dye at 160 F. with 2 quarts of water per pound of dye. Add it to the prepared dyebath at anywhere from 80 to 140 F., according to the recommendations of the manufacturer. Add salt after circulating the dyebath for 10 minutes and continue dyeing to the point of satisfactory exhaust.

You can develop very pale shades by adding 0.1 ounce of sodium nitrite per gallon of dyebath at 100 F. After 10 minutes, add 2 quarts of sulfuric acid per 100 gallons of dyebath. Development will be completed in 15 minutes for easy-to-develop dyes. Others require an additional 10 minutes at 120 F.

In a two-bath method for darker shades, add 0.5 to 1.0 ounce of sodium nitrite per gallon of dyebath after the last addition of salt. When the bath reaches equilibrium, drain it and blow or suck down the yarn to 100% water content.

Close off the expansion tank from the dyeing kier and fill it with water. Add to it 2 ounces of sodium nitrite and 2 to 4 gallons sulfuric acid per 100 gallons of machine capacity. Open the tank valve and run the developing solution and water into



Mathieson SQUEEZES your caustic delivery costs

How? Many ways. For example, in most areas, you can order 73% Mathieson caustic soda by truck. The benefits to you are obvious. This concentrated solution means fewer deliveries, less shipping weight, less transportation cost. And only Olin Mathieson offers you this convenient truck delivery.

More ways Mathieson squeezes delivery costs? Location. Mathieson has eight producing plants and shipping points (with a ninth under construction) covering the industrial South and East, with barge, rail or truck shipments to suit your needs.

Convenient truck scheduling: we time deliveries when you need them. Service: as you have a right to expect, it's part of company policy, backing every Mathieson chemical with technical assistance. For full details, write OLIN MATHIESON, Baltimore 3, Maryland.

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CHEMICALS DIVISION Olin

Why do you always look like Miss America, Nancy Anne?

**Everglaze is a trademark signifying fabric processed and tested according to processes and standards controlled and prescribed by Joseph Bancroft & Sons Co.*

One reason is the Rohm & Haas RHONITE® resin in these attractive *Everglaze fashions. RHONITE penetrates inside the textile fibers, reacts there to create crease-resistant crispness that stays fresh through hours of wear and repeated launderings.

The easy-care, wrinkle-resistance of RHONITE is perfect for Nancy Anne. People expect her to look like Miss America always, everywhere she goes, because she *is* Miss America 1961, Miss Nancy Anne Fleming.

Get technical information on RHONITE resins for wash-wear finishes, calendered effects, textured, and stabilized cotton, rayon, and blended fabrics by contacting your Rohm & Haas representative.

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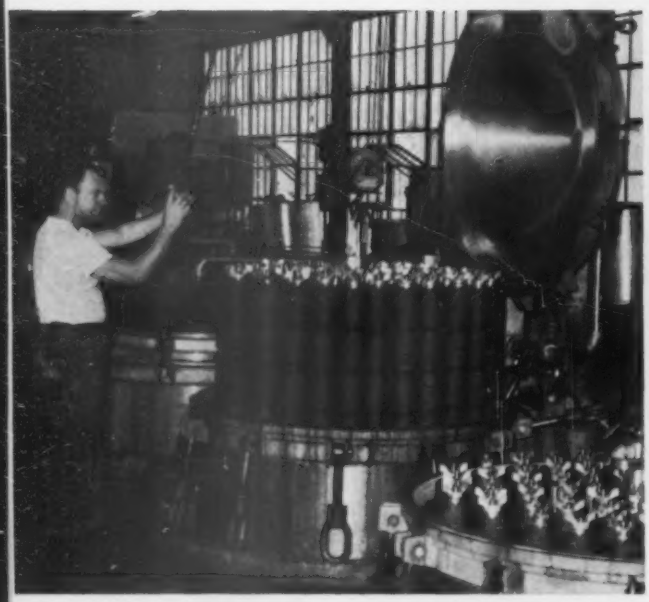
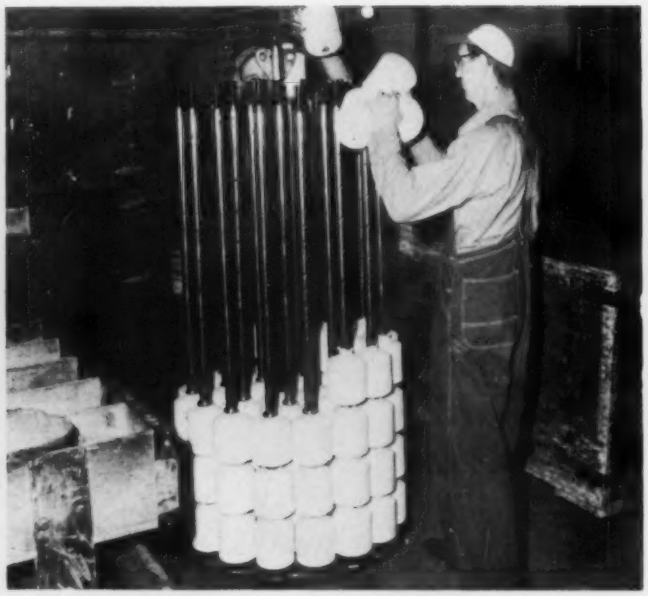
RHONITE

CIRCLE 87 ON READER SERVICE CARD

Four Keys to Better Vat Dyeing Of Yarn Packages



MODERN MACHINES have controls for time and temperature, thus can duplicate shades from lot to lot.



TALL CARRIER is suitable for narrow yarn packages on 1¾-in. tubes. Packages are stacked nine high.

the kier until the system is full. Circulate the bath for 15 minutes at 100 to 120 F. according to the specific dye and formula used.

In either of these methods, development is followed by rinsing, neutralizing with a weak, soda-ash solution, and a final scour with soap or a detergent.

NOW, TIME TO RINSE

After dyeing the yarn by any of the foregoing methods except the soluble-vat method, you must rinse it well. There should be some active hydro left in the dyebath. So if possible, rinse the first time with a flushing action, without dropping the bath. Or you can extract the yarn as soon as possible to blow out residual reduced dye, and follow with a fresh rinse.

In modern equipment, rinse water passes through packages and drains away without being recirculated.

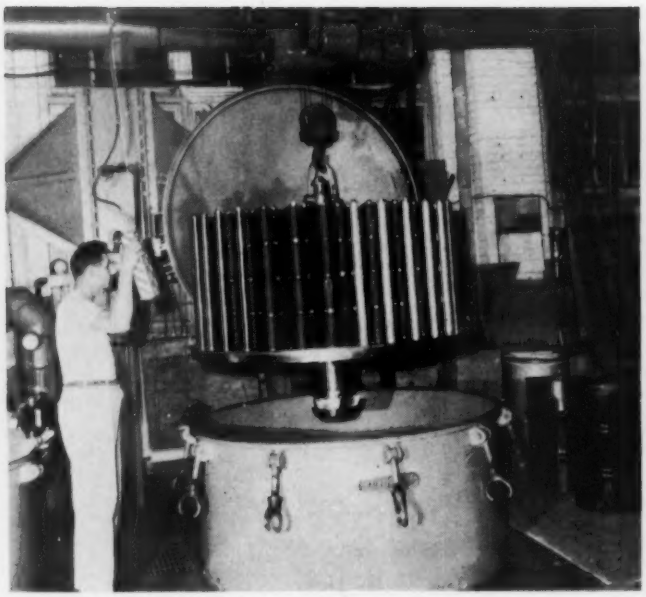
The sodium-leuco compounds of some dyes, such as Vat Red C. I. #73360, in medium and dark shades have a low affinity for cotton and cannot be rinsed in the same way as most vat dyes. For these colors you add salt near the end of the dyeing step to increase the dye affinity, then chain off the dyebath and follow with two fresh cold rinses. These rinse baths carry 2 to 4 ounces of salt per gallon, which help the fiber retain the dye while the reducing chemicals are washed away. Sometimes sodium bicarbonate is added to lower the pH of the wet yarn and to reduce the solubility of the leuco compound in the rinse water.

An alternative method with dyes of low affinity is the blowing out of excess dye liquor with compressed air. This method also partially oxidizes the dye.

Fastening the dye—The vat dye absorbed by the yarn is returned to its oxidized state by treatment with sodium perborate or hydrogen peroxide. In England sodium hypochlorite is widely used for this purpose of dye fastening.

Sodium perborate is applied at a rate of a 1 to 3% solution. Peroxide (130-vol.) at 0.05 to 0.1% is usually enough to complete oxidation of the dye. Application is usually at 140 F. In fact, peroxide is favored today. Sodium perborate is a holdover from days when concentrated peroxide solutions were not available.

The oxidation bath is acidified with 0.1 to 0.2% acetic acid after circulating a few minutes. Sometimes 0.2 to 0.3% sodium bicarbonate is used instead of acetic acid. Acidification of the oxidizing bath is good insurance against remaining traces of hydro that can prevent



SQUAT CARRIER, with packages stacked four high, carries as much yarn as tall carrier (facing page.)

PORT DRYER handles viscose rayon which, wrapped in porous paper, is often dried in cake form.

complete oxidation in hard-to-reach areas of the packages.

Soaping for shades—The soaping treatment after oxidation develops the final shade of a vat dye. The most effective material is an 0.25% solution of soap. But if you use soap, make the soaping and rinsing baths of soft water or provide sequestrants that keep the polyvalent metal ions from precipitating.

You can eliminate hard-water difficulties if you use nonionic detergents instead of soap. Detergents also rinse out freely, and their residues do not develop rancid odors or discolor the yarn. To speed up their action, some dyers add 0.1 to 0.2% per gallon of soda ash.

To speed the true-shade development of some indanthrene vat blues that tend to over-oxidize in the oxidizing bath, add 0.1 ounce of dextrose per gallon of liquor. If the formula also contains easily reduced dyes, don't use dextrose in the bath.

After you have soaped the yarn, you can finish it in the package form by treating it with softeners and lubricants dissolved in a fresh bath. Sometimes dyers omit this step and soften the yarn during the backwinding process by passing the single ends between wax disks or through a softener solution.

In any case, the completely dyed yarn is removed from the machine, then extracted and dried by processes described in Part 3 of this series (TEXTILE WORLD, June 1961, p. 80).

How to Vat Dye Viscose Rayon

You can dye viscose rayon in package form by the same basic methods that apply to cotton. But because of inherent differences between the two fibers, you must modify the dyeing process.

Viscose swells greatly in a caustic solution. So you must wind the packages to a lower density than you would for cotton. Packages of viscose rayon usually weigh 8 to 20 ounces. A large package on a ⅝-in. tube is nearly impossible to penetrate with dye liquor when it is wet and swollen.

Vat dyes exhaust rapidly on viscose. This is why you should start Class I dyes at 60 to 70 F., so as to get good pigment distribution before the maximum dyeing temperature of 140 F. for this class is reached. The low temperature reduces the swelling tendency of the viscose, and the dye exhausts much more slowly. Liberal amounts of retarding agents are often used on

viscose dyeings to slow down dye uptake further.

The circulation of pigment without reducing agents through yarn unswollen by alkalis is helpful in getting even dyeings. Since light shades are susceptible to unevelness, they are seldom helped by ultimate high-temperature dyeing (195 F.), which may level out darker shades.

Important points in using Class I dyes in light shades are low-temperature pigmentation, adequate leveling agents in the bath, and a high flow rate of dye liquor.

For Class 2 and Class 3 dyes and indigoid derivatives you can use the methods previously described, or you can start dyeing at 195 F. when the sodium-leuco compound is stable or can be protected at this temperature. You can often improve color yield by slowly lowering the dyeing temperature to that which gives the maximum exhaust.

Printing hydro—Printing hydro or sodium sulfoxylate formaldehyde is sometimes used in place of sodium dithionite (ordinary hydro) to get good leveling in some light shades. First, circulate the dispersed pigment well through the yarn, and then at about 150 F. add caustic and sodium solfoxylate formaldehyde. Gradually raise the dyeing temperature. The sulfoxylate will begin its reducing action as the higher temperatures are reached. This way, reduction is slow and dye is uniformly exhausted throughout the packages.

Picking your dyes—You need a good knowledge of the working properties of vat dyes that you expect to use on viscose, particularly in compound shades. Also, you must carry out rinsing and oxidation procedures with great care. Class II and Class III vat dyes and indigoid colors rinse out unevenly. Viscose packages become very dense by the time dyeing is complete. This density interferes with the caustic and hydro removal, and it also holds up penetration of oxidizing agents and final rinsing. That's why you need more time for dyeing viscose than for cotton.

Other aides in dyeing viscose include salt in the dyebath and the first rinse, which helps to retain the dye. Sometimes sodium bicarbonate is added to the first rinse bath after reduction, to lower the pH rapidly and prevent dye bleeding. The reduction bath entrained in the yarn is often removed by vacuum or pressure extraction after the bath is dropped.

Viscose retains caustic and hydro tenaciously. You must take every care to remove all traces of these chemicals. Unlevel dyeings can be traced back in some cases to residual hydro that survived the oxidizing step and caused color to wash out during soaping. Perfectly penetrated lots cause unlevel dyeing.

How Blends Behave in Vat Dyeing

Blended and plied yarns of cotton and viscose don't offer the same dyeing problems of all-viscose yarn. They behave more like all-cotton yarns. You'll get a good union more easily with mercerized cotton than with natural cotton.

Some vat dyes can give better unions on cotton-viscose blends than others. Among these are:

Vat Yellow 2 C. I. #67300
Calcoloid Fast Yellow GL
Calcoloid Fast Yellow CGL
Vat Yellow 15
Vat Orange 15 C. I. #69025
Vat Orange 9 C. I. #5970
Vat Red 1 C. I. #73360
Vat Violet 2 C. I. #73385
Vat Green 1 C. I. #59825
Calcoloid Brown G. Prototype 380
Vat Brown 2 C. I. #69015
Vat Brown 1 C. I. #70800
Vat Black 27 C. I. #69005

Making Vat Dyeing Work on Wool

Probably the first word that should be said on this subject is "careful."

You can apply vat dyes to wool by three different methods. Each has its limitations.

• **Ammonia**—This method relies upon ammonia for the alkaline component of the reducing bath. About 0.05 to 0.1 ounce of 28% ammonia per gallon of dyebath is recommended, plus 0.05 to 0.1 ounce of hydro. You can also add 0.1 ounce of glue or sodium lignin sulfonate to act as a buffer. This method demands constant attention of skilled supervision. Only indigoid vats are applicable.

• **Crystalline trisodium phosphate**—This alkali is used in dyeing wool with vat dyes as disclosed in British Patent 388,044 to Imperial Chemical Industries Ltd. TSP provides a relatively high pH with little damage to the wool. Many indigoid and anthraquinonoid dyes can be applied with the aid of TSP. From 2 to 4 ounces of TSP per gallon of dyebath is recommended for anthraquinonoid types. Dyeing is done at 120 to 140 F. The dye is first reduced in a stock vat with 4 ounces per gallon of TSP and 1 ounce per gallon of hydro. The dyebath for indigoid types takes ¾ ounce per gallon of TSP crystals and ¼ ounce per gallon of hydro.

• **Caustic soda**—This also can be used to assist vat dyes applied to wool. Practically all the anthraquinonoid dyes can be used with this method. A nice balance between time, temperature, and caustic concentration is necessary to avoid damage to the wool. But if you can control these factors, you'll get good results. Research has shown that from 0.5 to 0.75 ounce per gallon of caustic soda can be used in the dyebath.

Sodium lignin sulfonate is sometimes added as a protective agent in vat dyeing wool. Dyeing temperatures may vary from 110 to 140 F., according to the findings of different researchers and the dyes involved. In any case, light and medium shades are relatively easy to produce. Heavy shades require higher concentrations of caustic soda and common salt.

Vat dyes are selected for their affinity for wool and their fastness to sun fading. Fade-Ometer results do not correlate well with sunlight exposure tests.

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Fancourt laboratories have developed many special-application formulas for handling problem materials, as well as a wide range of standard products. Experience like this has earned us the description of "custom chemists to the textile industry" — a description we take great pride in, and great pains to live up to.

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For complete details write for Data Bulletin C-4

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Darker shades of polyester fabrics and their blends are more in demand than ever.

In step with this trend, Eastman offers an expanding series of polyester dyes, providing the best all 'round fastness characteristics of polyester dyes currently available.

Specifically developed for use with polyester fibers, these dyes exhibit outstanding fastness to washing, light, sublimation, crocking, perspiration, dry cleaning and wet pressing.

Equally important are their excellent processing characteristics...good build-up, good exhaustion and outstanding leveling properties. Thus, darker shades of navy, brown and grey are economically obtained.

Dyeing with Eastman Polyester Dyes is easily accomplished with carriers or under pressure at elevated temperatures. Fibers can be readily dyed in tow, tops, stock, or fabric forms. Fabrics of polyester filament can be conveniently dyed in jigs. Fabrics woven of spun polyester yarns alone or blended with cotton, viscose or wool can be easily dyed in dye-becks.

Get the full story of this outstanding line of dyes for polyester fabrics from your Eastman representative.

Eastman Polyester Dyes

Eastman Polyester Dyes are sold in the United States by EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of EASTMAN KODAK COMPANY, in Kingsport, Tennessee; Lodi, New Jersey; and Greensboro, North Carolina. On the West Coast through WILSON & GEO. MEYER & COMPANY, San Francisco, Los Angeles, Portland, Seattle, Salt Lake City. In Canada through CLOUGH DYESTUFF CO., LTD., St. Laurent, P. Q.

Making Canvas Last Longer

TESTS, such as this weather exposure test rack in Columbus, Ga., help the company find ways to improve canvas.

WATER retention is just one test to which treated canvas bags are subjected. Bag must hold 500 cc. for 8 hours.

Untreated canvas is easy prey to mildew and effects of outdoor exposure. But you can stretch the life of your canvas product with the right kind of protection. Here's how one company turns out canvas that resists mildew, sunlight, and water.

NOW, you can extend the life of canvas used for outdoor purposes by several hundred percent. How? Protect it against mildew, sunshine, and water the way Reeves Bros., Inc., does at its Eagle & Phenix Finishing Plant, Columbus, Ga.

Reeves' process is both old and new. Old, because the basic mildew-proofing agent and coloring materials have been known for many years. New, because sustained research has now perfected the process, made it better and more effective. The secret: impregnation with a salt derived from monazite sands.

MINERAL DYES HELP

A high percentage of the mildew-proofed canvas run at Eagle & Phenix is dyed to a pearl-gray shade with chromium-based pigments or to various shades of khaki by means of iron compounds.

These pigments are a valuable aid in protecting the canvas against sunlight. And the chromium-based shades have a good deal of built-in mildew resistance without further treatment.

But to get maximum resistance to mildew damage, Reeves impregnates the goods with a salt derived from monazite sands.

CONTINUOUS PROCESSING

Reeves processes canvas on a range that provides for dyeing, mildew-proofing, and water-repellent treatments. The company makes up gray goods in lots and impregnates them with soluble chromium or iron salts plus the mildew inhibitor. This liquor includes a wetting-out agent. The company uses a heavy three-roll pad for good penetration.

At this stage the materials are dryed and the mineral-salt content is set. Then the goods are put into a caustic-soda bath, which precipitates the metallic salts as insoluble hydroxides in the fiber. A pad squeezes out excess liquor. The goods are then washed thoroughly. Reeves neutralizes the last traces of caustic with acetic acid.

Next, Reeves moves the goods onto a stack of cans, and partially dries them in preparation for the Vivatex water-repellent treatment. Reeves has developed this treatment so that it gives excellent water repellency. The company applies the water-repellent product in a pad set up to give two dips and two nips to the goods. The Vivatex bath also contains a booster shot of bacteriostatic material to increase mildew resistance. Final drying is on a stack of cans.

Reeves handles the goods without undue tension to preserve the normal tight construction of good-grade canvas. However, it gives the goods a final pass through an open tenter with steam to even them out and regain the small amount of width lost in the treating range. That winds up the process.

EARLY QUALITY CHECKS

Because canvas products are subjected to rugged use and exposure, Reeves starts its quality-control program by checking all the physical characteristics of the goods before they are processed.

Every lot headed through the plant is checked continuously in the laboratory. Some of the tests made on both gray and finished goods are count, weight, breaking strength, and hydrostatic resistance. In addition, finished goods are checked for spray rating, wax content, mildew resistance, and weather resistance. Shrinkage control tests also are run when necessary. Finally, the finished goods undergo the so-called "bag test." In this test, a sample of the finished fabric is folded to form a container holding 500 cc. of water. The bag is then hung for 8 hours. The material is passed only if there is no leakage. Most of the canvas bags will hold water for a long, long time.

PROOF POSITIVE

The effectiveness of the mildew-proofing treatment is demonstrated by recent tests made by an independent laboratory. Vivatex-treated canvas goods were exposed to the weather in a semitropical area for 9 months. At the end of that time, little or no mildew or algae had formed on the canvas, and the goods had retained 72% of their original strength.

The importance of mildewproofing, even when canvas is to be coated with vinyl resins, is pointed up in an unofficial report from the U. S. Coast Guard Service. On Coast Guard vessels, Vivatex-treated canvas awnings with a vinyl coating are giving two to three times better service than untreated coated canvas.

WHAT THE PLANT MAKES

Eagle & Phenix is a commission finishing plant. Most of the canvas treated range from 7.98-oz. to 16-oz. goods, with a great proportion in the 8.98- to 11.23-oz. range.

The burgeoning small-boat business is responsible for 30 to 40% of yardage run at the plant. Service conditions in this field are about as tough as any that canvas products are subjected to.

CMC
the soft warp size for good hand

This improved size prevents undesirable fabric stiffness, even when finishes are applied directly to fabrics that have not been desized. That's because warps sized with Hercules® CMC remain soft and flexible. Moreover, if man-made fibers are being woven, CMC's softness, combined with its film strength, helps improve weavability. For additional information on the properties of CMC Warp Size, and its contributions to the production of quality fabrics with a good hand, write to Hercules Powder Company today.

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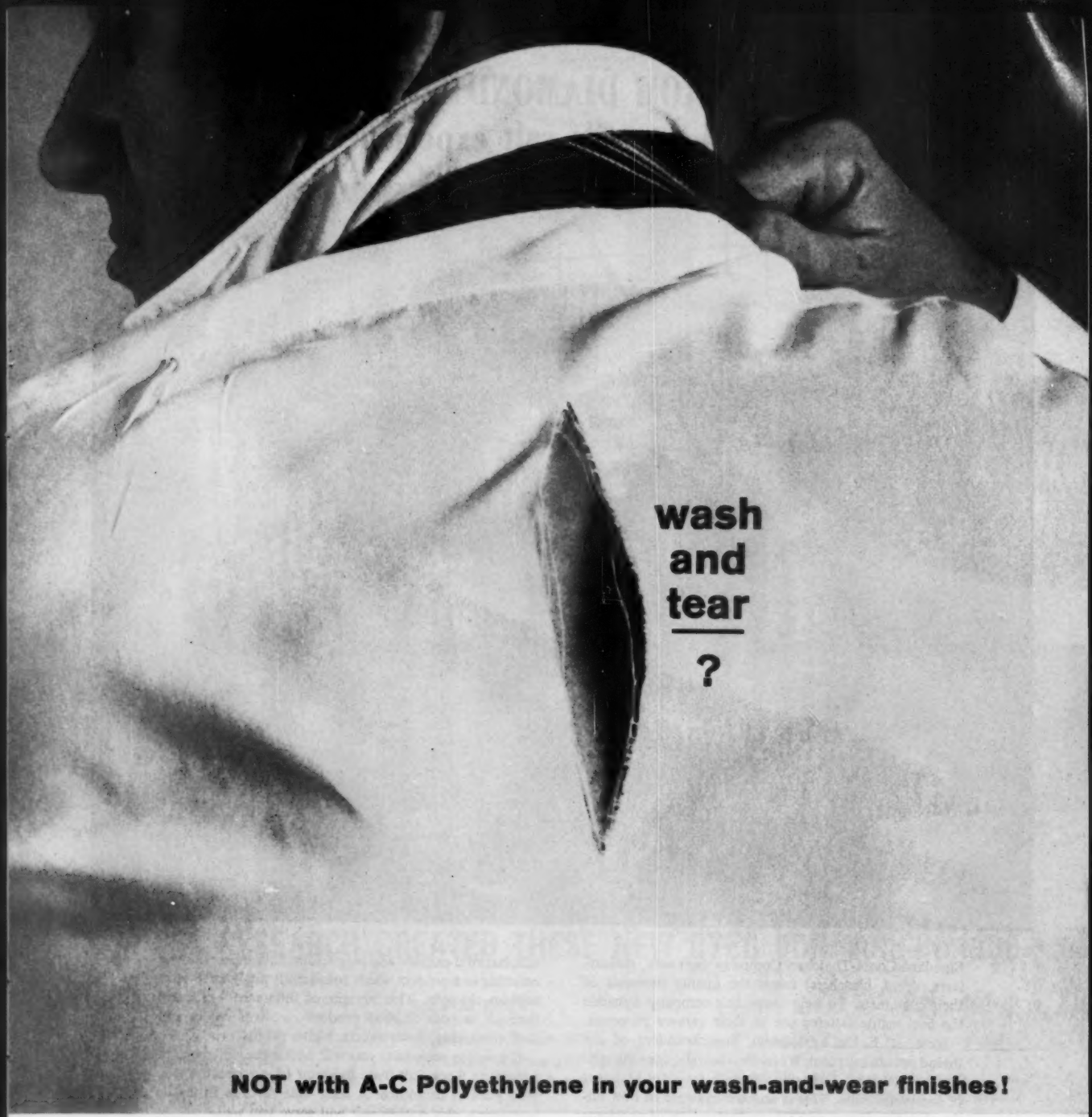

NOT with A-C Polyethylene in your wash-and-wear finishes!

Concerned over loss of tear strength caused by some wash-wear resins? A-C® Polyethylene can help you!

Combined with conventional resins, this new emulsifiable polyethylene overcomes such loss—actually raises tear strength to *above* normal. Imparts extra crease resistance, too. And A-C Polyethylene is permanent through multiple cleaning cycles.

Finishes formulated with A-C Polyethylene stay *white*, do not retain chlorine, resist scorching. They afford excellent abrasion resistance and antifrictional properties. Won't affect lightfastness or dye shades.

Ask your textile chemical supplier for an A-C Polyethylene finish for your specific needs. Or write for information to: Plastics Division, Dept. 613-TW, 40 Rector Street, New York 6, N. Y. In Canada: Allied Chemical Canada, Ltd., Montreal.

PLASTICS DIVISION
40 Rector Street, New York 6, New York
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Allied Chemical

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the textile salt experience of Jim Selbee!

Standard-Coosa-Thatcher Company (spinners, mercerizers, dyers, bleachers) meets the quality demands of their customers. To help them, this company demands the best textile salt for use in their various processes.

Here, H. E. DeLay (center), Superintendent of the thread processing plant, Rossville, Georgia, consults with Jim Selbee (right), Diamond Crystal's Assistant Manager of Industrial Sales. This is another example of how on-the-spot experience and the understanding of problems by home office officials, helps Diamond Crystal salesmen serve your needs more efficiently.

Diamond Crystal C.M.F. type salt offers textile processors a unique margin of difference. Unlike ordinary salt, harmful calcium and magnesium have been removed resulting in a product which consistently analyzes 99.95% sodium chloride. This margin of difference will carry through to your finished product . . . true colors and uniform dyeing, fewer rejects, higher profits.

If you use rock salt, you will notice the difference in Louisiana Rock Salt from Jefferson Island, because it is 99% pure at its source. A long time favorite in textile processing, this quality salt will serve you well.

Learn exactly how these features can benefit you. For immediate service and consultation on all your salt requirements, call or write the nearest Diamond Crystal sales office.

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ANNOUNCING 2 NEW VAT COLORS

New "Ponsol"* Golden Orange 3GN Paste Has Low Shade Change When Resin Coated

"Ponsol" Golden Orange 3GN Paste is an improved anthraquinone-type vat dye recommended for application to cotton and rayon by all types of textile dyeing procedures, including printing. It produces bright golden orange shades, and provides improved high temperature stability and less shade change when resin treated. It also has good transfer or level dyeing properties and good fastness. This new dye can be substituted pound for pound in place of Vat Orange No. 15 . . . at equal value.

"Ponsol" Yellow PGN Double Paste

"Ponsol" Yellow PGN Double Paste is an improved anthraquinone-type vat paste that produces excellent reddish-yellow shades with good fastness. The product will also be of value as a shading color for packages, beams and piece goods. It has reasonably good vat stability but is not recommended for machine dyeing at temperatures above 140° to 160° F.

"Ponsol" Golden Orange 3GN Paste

"Ponsol" Yellow PGN Double Paste

news from Du Pont

DU PONT RESEARCH CREATED THESE NEW DYES FOR YOU IN 1960

CATIONIC DYES

"Dekatyl"* Brilliant Red B
"Dekatyl" Brilliant Red 3G
"Dekatyl" Blue G
"Sevron"* Brilliant Red 2B

DISPERSE DYES

"Latyl"* Yellow YLW
"Latyl" Orange NST 50% Paste
"Latyl" Red MG
"Latyl" Red MG 50% Paste
"Latyl" Bordeaux B 80% Paste
"Latyl" Blue BCN 80% Paste
"Latyl" Blue RLN
"Latyl" Blue 2R 80% Paste
"Latyl" Blue 4R 80% Paste
"Latyl" Brilliant Blue BG 80% Paste

SULFUR DYES

"Sulfogene"* Yellow RCF
"Sulfogene" Carbon HCF Liquid
"Sulfogene" Carbon MCF Liquid

VAT DYES

"Ponsol"* Yellow PGN Double Paste
"Ponsol" Golden Orange 2BG Double Powder
"Ponsol" Golden Orange 3GN Paste
"Ponsol" Golden Orange 3GND Double Powder
"Ponsol" Brown AGD Double Paste
"Ponsol" Brilliant Violet 4RNP 80% Paste
"Ponsol" Blue BFDP Double Powder
"Ponsol" Blue BFLBB
"Ponsol" Olive F Double Paste

WHITE DYE

"Pontamine"* White NT Conc. Solution

If you do not have information on these new products in your files, check with your Du Pont representative.

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DYES AND CHEMICALS

Better Things for Better Living
. . . through Chemistry

NEW CONCENTRATED SOFTENER– "AVITEX"* Y

This new liquid compound is effective on all types of fibers, and in the case of hydrophobic synthetic fibers also provides moderate antistatic protection. "Avitex" Y improves the tear strength, napping properties, hand and sewing characteristics of treated fabrics and can be applied alone or with starches, gums and thermoplastic, thermosetting or thermoreactive resins.

The new softener causes only slight changes in the shade of selected vat and fast-to-light direct dyes, and does not result in any serious reduction in lightfastness.

Fabrics finished with "Avitex" Y have excellent resistance to discoloration and odor. Treated fabrics do not become yellow when exposed to heat, light, ozone or atmospheric oxides of nitrogen that are often encountered during application or storage.

"Avitex" Y is readily dispersed in water at temperatures of 100 to 160 degrees Fahrenheit and can be applied by padding, spraying or by exhausting from a long bath. It has a high degree of substantivity for cotton, rayon, nylon and other synthetic fibers. The recommended concentrations vary from 0.1 to 1.0%, depending on the fibers being treated and the effect desired.

USE	REMARKS
Self-finish on Newer Synthetic Fibers	A pleasing surface feel plus lubrication
Self-finish on Cotton or Rayon	Pleasing limp hand
Thermoplastic Resins	Effective plasticizer
Starches and Gums	Compatible with cationic modified starches in addition to usual starches
Thermoreactive and Thermosetting Resins	Excellent finishes obtainable with improved tear strength; no effect on chlorine retention damage

news from Du Pont

AMERICAN TEXTILE CONSUMERS TO SEE NEW TELEVISION SHOW– THE "DU PONT SHOW OF THE WEEK"

An estimated 77 million different people will view a new Du Pont show in a 40-show season beginning next September 17th.

The show—scheduled for the 10 to 11 p.m. time slot on Sunday evenings over NBC—will include musical variety programs, dramas based on real-life people and events, and special projects on matters of national importance.

Of special interest to the textile industry will be the commercials on Du Pont textile products and on Du Pont's fundamental research to satisfy the present and future needs of the world's consumers.

Carried on 150 stations, the program will be available in some 97% of U. S. television homes and will continue to build the recognition and respect the consumer holds for products associated with the Du Pont name—an association that means a powerful sales advantage for fabrics dyed with Du Pont dyes and treated with finishes such as Du Pont "Zelan"* durable water repellent.

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DYES AND CHEMICALS

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DU PONT OF CANADA LIMITED, Montreal, Canada

Technology Overseas

Czechs Use Isotope to Measure Pad Uniformity

Two Czech textile engineers are putting a radioactive isotope to work measuring residual-moisture content of fabrics leaving a padder. The radiation source, thallium 204, moves back and forth across the underside of the fabric. A detection unit on top of the fabric is synchronized with movement of the radioactive thallium. The Czechs calibrated the unit for direct measurement of moisture in weight-per-unit area. The instrument has a double purpose: (1) quality control for moisture content and (2) inspection of pad rolls for irregular crown or periphery during production.

British Develop Shuttleless Picking Device

A new picking motion for shuttleless looms uses two rotating disks for direct insertion of the filling. Developed by Professor John J. Vincent, Manchester College of Science & Technology, the new device is still in the experimental stage. But Professor Vincent claims looms using the unit can operate at 500 ppm. Here's how it works: The yarn passes through the nip of two rotating disks and is projected through the warp shed. In a demonstration a 3s cotton yarn was passed through a 1¾-in.-dia. ring that was 6 feet from the disks. The unit works best with coarse yarns, but in theory it can handle 50s yarn.

Dutch Replace Flax Retting With Chemicals

Linen fiber can now be removed from flax by a mechanical and chemical process, developed by the Netherlands Research Institute T.N.O. The first commercial application (by A.K.U. Algemene Kunstzijde Unic N. V.) is now under way. During the process, green flax is handled continuously. Although the method eliminates retting, the end product is still a natural-linen fiber. The new method offers these advantages: shorter production time, greater fiber strength, and improved quality. High fiber strength makes processing and finishing easier.

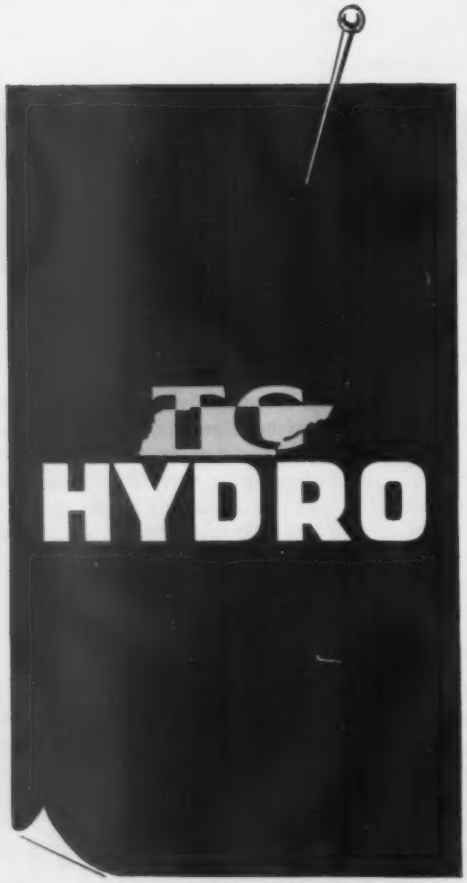
Germans Use Electrostatic Flocking for Carpet

A new process, developed in West Germany, makes a nylon-carpet pile 3 to 4 mm. long. Previously flock printing was limited to short fibers up to 0.6 mm. The backing is jute treated with latex. Nylon cut staple is pulled vertically into the backing by an electrostatic charge. To date, nylon is the only fiber that works on the flocking method. But experiments are continuing with other man-made fibers. Today, production capacity is 500,000 square meters per year.

Russians Boost Cotton Yield With Electricity

A Russian scientist from Azerbaijan has increased the yield of cotton by subjecting the seed to high voltage. The treatment: Soak the seed in water for 24 hours, dry it, and then bombard it with 2,500 volts in a special chamber. The Russian claims this treatment increases germination energy. The seeds sprout 2 to 3 days earlier and the plants have more buds and bowls, he says.

For more information on any item above, write Department KS, Textile World, 330 W. 42nd St., New York 36, N. Y.



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let's talk about...

POLYLUBE FFN SPECIAL

. . . Laurel's versatile finishing agent

Now is the time to join the industry swing to POLYLUBE FFN . . . Laurel's new, *improved*, non-ionically dispersed polyethylene emulsion. These advantages tell why it is best for use in your plant:

. . . **POLYLUBE FFN's** superior lubricating properties at high temperatures make it an ideal high-speed sewing thread lubricant.

. . . **POLYLUBE FFN** imparts a soft springy hand to piece goods—improves the drape as well as sewing and cutting properties.

. . . **POLYLUBE FFN,** applied to resin-treated goods materially increases both tear strength and crease resistance.

. . . **POLYLUBE FFN** is stable to acids, alkalies, and salts even in very high concentrations for extended periods of time.

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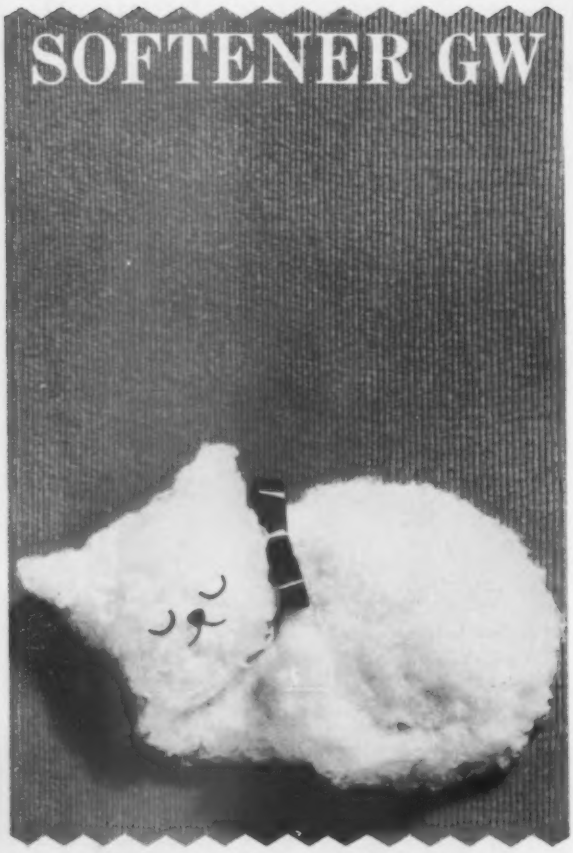

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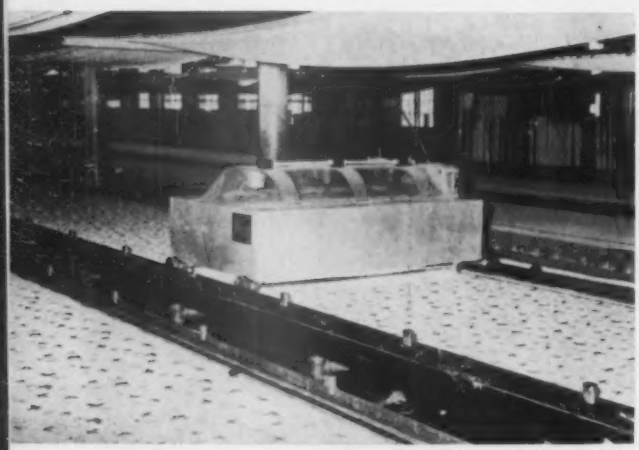
TEXTILE WORLD . . . COST CUTTERS

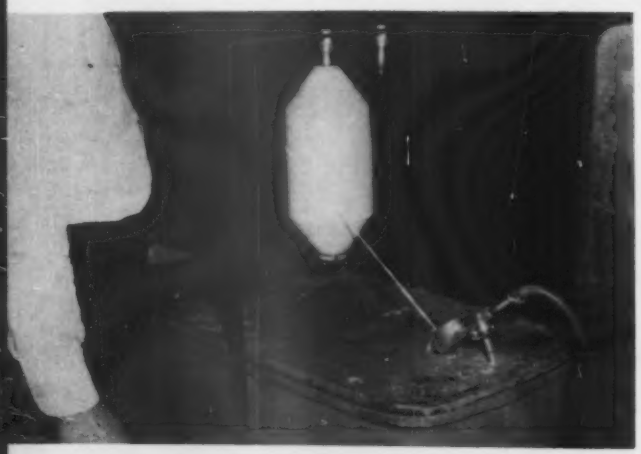


Traveling Dryer Speeds Printing 30%

Brittany Dyeing & Printing Co., New Bedford, Mass., gets nearly one-third more production from its 24 hand-screen printing tables with its new traveling dryer.

One of the problems of operating a screen-printing plant within 500 feet of New Bedford harbor: The atmosphere is often very damp. The moisture slows drying of print colors so much that printers often have to wait before applying a second color.

The new dryer carries 24 250-watt infrared lamps and has three small fans to aid in moving air from under the housing. It travels continuously back and forth over the table at about 10 ypm. An overhead conductor applies power to the driving motor. Limit and reversing switches are mounted at each end of the 80-yd. tables.



Clearer Saves 80% in Time

Here's a homemade roving clearer that's saving 80% of the time formerly required for straightening up roving bobbins and pulling out tangles at Carolina Mills, Inc., Newton, N. C. Besides being five times as fast as hand straightening, the clearer saves much waste since less is pulled off the bobbin.

The clearer improves quality by fluffing up the re-workable waste—literally blowing it to pieces. Waste goes back into the stock at the bale breaker.

The company made the roving clearer from an old doff box with a hinged cover (photo). It attached a fitting, leading through the cover, to an air hose. When air is turned on (60-lb. pressure is used) it creates a strong vacuum that pulls the roving rapidly into the truck. Here fibers are blown apart.

Trucks Halve Fabric-Handling Costs

Handling costs have been cut 50% and storage space increased 100% at the dyeing and finishing plant of Collins & Aikman, Albermarle, N. C. Reason: three electric trucks (Lewis-Shepard) that lift 4,000-lb. loads 12 feet high.

These trucks handle gray fabric, chemicals, and other supplies. After fabrics are finished, they are stacked in racks three tiers high, right up to the ceiling. The company stores rolled goods to be shipped on pallets 52x60 inches. Two ends of each pallet are enclosed to hold the rolled goods. Finished fabric is placed crosswise on the pallet.

An average of 600 pallet loads of goods is held in the warehouse, with up to 1,500 fabric shipments made each week.

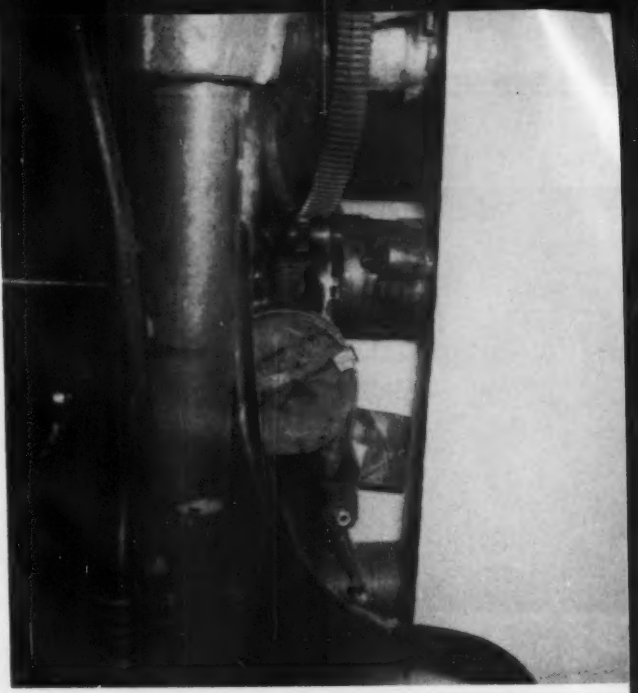
Selvage-Print Guide Eliminates Seconds

An electric guider of the type used on tenter frames, plus a new mount for the selvage printer, has solved a small but provoking problem for Reeves Bros., Eagle & Phenix Finishing Div., Columbus, Ga.

The selvage printer is mounted so that it can travel laterally. A screw driven by a reversible motor provides its motion. The electric guider controls position of the printer by following the selvage of the goods as they are fed into a steaming tenter.

The conventional air-operated guiders that control cloth position do the major part of lining up the goods. But they are located too far from the printer to provide really accurate positioning.

Now off-prints or prints in the body of goods and seconds from these causes have been eliminated.



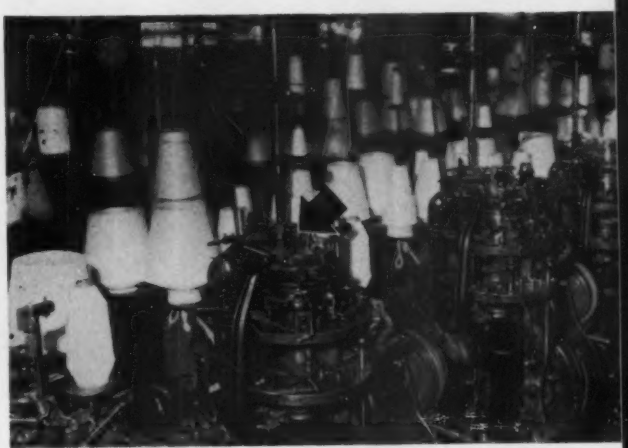
Hosiery Clipper Cuts Waste Yarn 8%

Machines to knit half hosiery at Villa Rica Mills, Villa Rica, Ga., are only 3 years old. But they're being improved continuously. Latest improvement: clippers for rubber yarn (arrow).

Originally, knitters had to clip rubber yarn by hand. But now clippers do the job automatically. On each sock, 6 inches of yarn are saved (8% of yarn used).

The company buys the clipper from an outside shop. Mill knitting-machine fixers install attachment in 5 man-hours without any machine alterations.

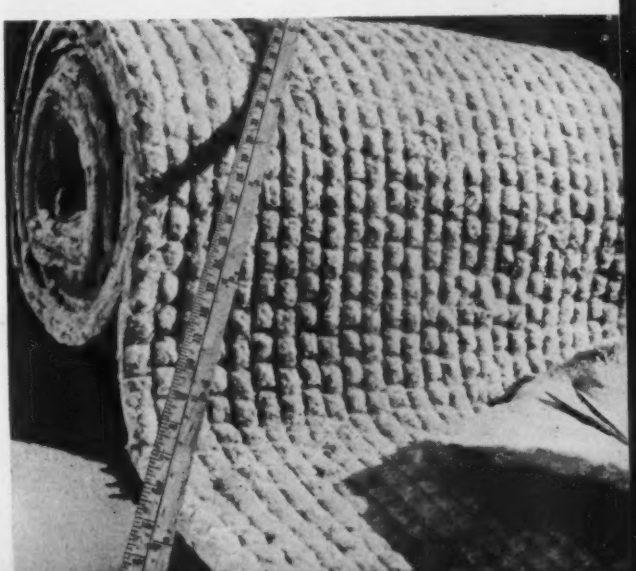
Paul Newman, knitting superintendent, says, "We're installing these clippers as fast as knitting fixers can put them on without interference with their regular work. Our goal is one clipper installed per shift until all 107 machines are equipped."



Phenolic Resins Make Cheaper Batts

Lockport Mills, Lockport, N. Y., makers of cotton and wool batts for furniture, bedding, and packaging has improved its product at lower cost by replacing about 50% of the cotton needed to make a batt with Durez resin (Hooker Chemical Corp.). The phenolic resin is a bonding medium used to impart strength, durability, and resiliency.

Here's how Lockport makes cheaper batts: Normally, a typical batt contains about 5 ounces per square foot of cotton waste. Such a product costs about 4.7¢ per square foot. Now, Lockport impregnates the waste with resin, cuts fiber weight to about 2½ ounces per square foot, and comes up with a product roughly 10% cheaper to make and with much more resiliency than an all-cotton batt.



Tie Straightener Saves $41,000

The simple tie-straightening machine shown here is saving Swift Mfg. Co., Columbus, Ga., more than $2,400 per year in labor cost and purchase of baling ties. Built in the mill shop during World War II when steel was scarce, the device has saved over $41,000. And it looks as if it may last 20 more years.

Before developing the tie straightener, Swift employed one man to straighten out bent ties with hand tools as a full-time job. Now, the opening-room cleaner tender handles this job along with other duties.

The machine smoothens out crooked ties between two steel rollers driven by an electric motor. The operation takes only a few seconds per tie. Result: much neater ties. The company buckles together the straightened ties and uses them for rebaling cleaning cotton.

Four-Point Cam Ups Output 10%

When the Grantville (Ga.) Division of Flagg-Utica Corp. recently rebuilt and modernized its spinning frames, it added some special features not found in older frames. One modification: a special Pettee four-point builder cam turns out a tight filling-wind package.

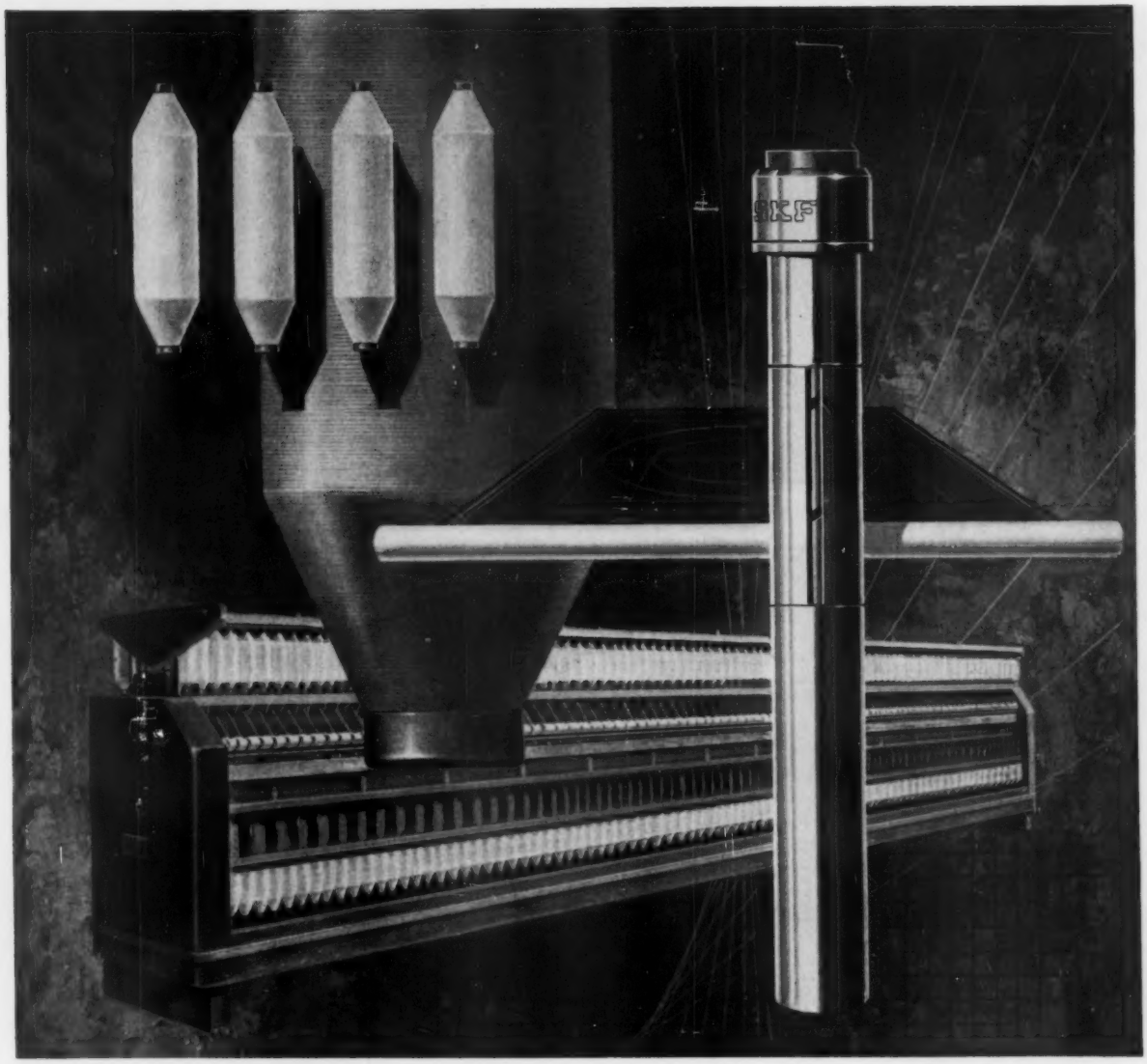
The cam has stopped yarn from sloughing off at the spooler, and filling is now spooled at 1,100 ypm. Before rebuilding the frames, the company used a combination wind that caused considerable trouble at the spooler. The improved builder ties down yarn at the top and bottom of the stroke to produce a firmer package. Production has increased 10% with 20% fewer ends down. In addition, the better-running yarn has contributed to increased work assignments and has made the operator's job easier at both spinning and spooling.

Moisture Screen Ups Production 1%

Ever have trouble with entrained moisture in your refrigerated air-conditioning system? Flagg-Utica Corp., Grantville, Ga. found the answer to this problem when its air-washer baffles became laden with lint. A home-made screen not only eliminates the trouble, but also increases spinning production 1%.

Mill Vice President William S. Flanagan and General Superintendent C. S. Smith solved the moisture problem. Here's what they did.

With treated wood ¾ inches thick and 4 inches wide, they built a frame 12 feet wide and 16 feet long, and covered it with No. 16 screen. They set up this screen 4 feet from the air washer and 18 inches from the floor in the direct path of air flow to the fan. Now water droplets escaping from the air-washer baffles are beaten down and out as they try to pass through the screen.



This new SKF bolster belongs in every plan for heavy-package, high-speed frames

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What's New This Month in . . .

Fibers, Yarns, and Fabrics

By NOREEN HEIMBOLD, Editorial Assistant, TEXTILE WORLD

Dyed Polypropylene

Before the year is out, Montecatini will introduce a dyeable polypropylene fiber. It's a modification of the company's well-known Meraklon polypropylene fiber.

Montecatini has made the polypropylene fiber dyeable by changing the polymer structure. Now the fiber is in experimental use only.

Fabric for Jets

A tough glass-fiber laminate soon will line baggage and cargo compartments of Boeing 727 and 707 jets. The laminate is manufactured by the Conolite Div. of Continental Can Co. and uses a high-modulus glass fabric produced by J. P. Stevens & Co., Inc.

The glass-fiber lining was chosen for its impact resistance and high strength-weight ratio.

More Colors, Deniers

American Bemberg is now producing Tusson in 12 solution-dye colors plus black and white. The color line is especially important in fabrics for home furnishings.

The slubbed cuprammonium rayon is available in 450-den. filament yarn bringing the available number of deniers to seven.

The company has also added 70-den. yarn to its Tusson line. This finer yarn is suited for blended dress and blouse fabrics.

Multifilament Now

A multifilament modacrylic yarn is now in limited commercial production at the Textile Fibers Dept., Union Carbide Chemicals Co. The yarn, called Fiber T during the experimental stage, has been renamed Aeress. Previously the company's production of Dynel acrylic fiber was confined to staple.

The new yarn has a higher resistance to heat and a higher acrylonitrile content than Dynel. Tensile strength is 2.5 grams per denier, both wet and dry. It is slated for use in woven-dress fabrics. Other uses are being studied.

Textured for Rugs

Eastman Chemical Products, Inc. is producing a new textured continuous-filament modacrylic carpet fiber. The Verel yarn is now available in 2700 denier. Several carpet manufacturers are evaluating it.

The yarn is priced at $1.00 per pound for natural color and $1.20 for solution-dyed colors, including light and rose beige, brown, green, and black.

One Bath, 2 Colors

Now knitters can get color styling more economically by single-bath piece dyeing. How? By using Orlon Type 44 in combination with Orlon Type 42. Type 44 is acid-dyeable and Type 42 is basic-dyeable. With each fiber accepting a different amount of dyestuff, knitters can obtain shade variations of two colors in a single bath.

Better Belt Yarn

Something's new in man-made belt yarns—a high-modulus, industrial yarn. American Enka has named it Suprenka Hi Mod. The company is now commercially producing the new high-tenacity rayon at its Lowland, Tenn., plant.

Because the yarn is very strong, manufacturers are testing it in conveyor belts, V-belts, ducks, radiator hoses, carpets, and tapes.

New Fire Fighter

Keasbey & Mattison Co. has introduced a fire-resistant cloth composed of highly reflective aluminum foil and fire-resistant asbestos cloth bonded together.

The new material, called Kamclad, is used for fire-fighting garments. It's also recommended for fire curtains, baffles, reflective blankets, and folding doors.

Main features include high heat resistance, good wearability, and no peeling or cracking. Weight is 1.25 pounds per square yard.

NEWS BRIEFS . . .

Stretch fabric line—United States Rubber Co. will add patterns to its stretch fabrics. The 20 new woven patterns are slated for use in women's and children's slacks for fall, holiday, and cruise wear.

Caprolan carpets—Two new Textured Caprolan carpets, Loring and Gallerie, by C. H. Masland & Sons, have received Allied Chemical Corp.'s "Certified for Performance" label.

Bedspreads — After January 1, bedspreads will be sold under a Cabin Crafts-Martex label. The two companies plan to consolidate their sales efforts to linen and domestics departments at that time.

Like silk and mohair—Golding Decorative Fabrics is introducing a casement fabric that resembles raw silk and mohair. The filling yarns are Dynel. Dacron is used for the warp. The 48-in. cloth is available in 14 pastel shades. Retail price is $2.49 per yard.

Low cost towel—Chicopee Mills, Inc. has developed a disposable nonwoven towel with a cloth-like texture. It may be rinsed, washed, bleached, or wrung. Cost: under 5¢.

Wool carpets — Downs Carpet Co., has introduced a new all-wool line, Coral Point, at the summer markets. In addition, two new patterns are included in the Elmardo and Royal Madar lines. Other lines have had more colors added.

TEXTILE WORLD . . . News from the Mills

Bates Mfg. Co., Lewiston, Me., has purchased 12 Model M6A Even-Draft Drawing Frames for its Edwards Div. in Augusta, Me., from Whitin Machine Works.

Beaunit Mills, Inc., New York, is constructing a $1.5-million building in Hamilton, N. C. The 85,000-sq.-ft. mill will produce circular-knit fabrics for underwear, outerwear and industrial uses.

Brisbane Fabrics, Inc., Woonsocket, R. I., has moved its facilities to the 28,000-sq.-ft. Glendale Mills, Burrilville, R. I.

Brower Mills, Inc., Hope Mills, N. C., recently purchased by Elk Cotton Mills, Inc., Fayetteville, Tenn., has added 2,200 spindles as part of a modernization program.

Bruck Mills, Ltd., Montreal, Can., which previously made only woven goods, is installing equipment to make double-knit fabric at its Cowansville, Que., plant.

Burlington Industries, Inc., New York, has announced the formation of a new company, Interglas Textil Ulm, Germany. The firm will manufacture and sell fiberglass fabrics in the European common market.

Callaway Mills Co., La Grange, Ga., is constructing a general office building in La Grange. The new 42,000-sq.-ft. building is scheduled to be completed by July 1962.

Carolina Narrow Fabric Co., Winston-Salem, N. C., has launched a building and modernization program for additional manufacturing and office space. The expansion is to be completed in the fall.

Columbia Mills, Inc., Syracuse, N. Y., and Athol Mfg. Co., Athol, Mass., have completed an agreement for Columbia to purchase Athol's pyroxylin embossing equipment, processes, and formulas used in the manufacture of pyroxylin artificial leather and book cloth.

Fawcett Mills, Inc., New Bedford, Mass., has added a new print machine and vat-and-acid ager combination. The company has increased its capacity by 25% for cotton printing, bleaching, dyeing, embossing, and finishing.

Flagg-Utica Corp., New York, has acquired Montezuma Knitting Mills, Inc., Montezuma, Ga.

Greenwood Mills, Greenwood, S. C., will build a cotton goods plant in Ninety Six, S. C. The factory, to be named the Adams Plant, will cost $6-million and will employ about 350 people.

Samuel Hird & Sons, Inc., Garfield, N. J., is closing down. A new firm, Samuel Hird & Co., will be formed by members of the family for wool topmaking and dyeing. J. P. Stevens & Co., Inc., has purchased the company's name and will incorporate the Hird sales organization into Stevens.

A. & M. Karagheusian, Inc., Freehold, N. J., is building a new spinning and dyeing plant in Statesboro, Ga. The spinning and dyeing operation at Roselle Park and the dyeing at Freehold, N. J., will be moved to the new plant. Completion of the plant is expected by December, 1961.

O. E. Kearns & Son, High Point, N. C., has liquidated its hosiery operations and plans to enter a new field. The nature of the company's new enterprise will be disclosed in late August.

The Kendall Co., Boston, has purchased 14 high-speed, two-delivery Model M7 Even-Draft Drawing Frames from the Whitin Machine Works for its Mollohon plant, Newberry, S. C.

Noone Mills, Inc., Peterborough, N. H., is the new name of the Noone Div., of the Huyck Corp., Rensselaer, N. Y. Sumner E. and Gordon K. Brown have recently purchased the division.

Reeves Brothers, Inc., New York, has appointed Wyndmoor Knitting Mills, Elizabeth, N. J. a licensed foam laminator of the Curonized process.

Riegal Textile Corp., Johnston, S. C., Div., is marketing its diaper products through house-to-house salesmen.

J. P. Stevens & Co., Inc., New York, has purchased a stock interest in S. A. Pierre Genin & Cie, Villeurbanne, France. The French firm is a leading producer of fiber glass and synthetic fabrics.

United Laces & Nets, Inc., Bridgeport, Conn., is closing its Leavers lace plant in Central Falls, R. I. The firm will consolidate its operations with the parent company, American Fabrics Co., Bridgeport, Conn.

Velveray Sales Corp., New York, is the new name of the company formed by Velveray Corp., New York, and Lynn Textile Mills, Inc., Holyoke, Mass. The firm will manufacture and sell laminated materials of polyurethane foam bonded to fabrics or plastics.

Whiting Hoisery Mills, Inc., Hickory, N. C., will occupy new quarters at Ninth Avenue and Fifteenth Street, NE, around October 1. Construction has begun on the $50,000 building.

Whittier Mills Co., Chattahooche, Ga., has installed Pin Drafters, supplementary winding equipment, and twisters. The new equipment will boost the capacity by 25,000 pounds per week of worsted, synthetic, and blended yarns.

treasure trove!

Celanese unearths a fabulous museumful of historic fabric designs to inspire magnificent new decorative fabrics for Celanese 1962 home furnishings promotion. From the archives of the Musée De L'Impression Sur Étoffes in Mulhouse, France, come fabrics dating from the time of Marie Antoinette. This collection, the largest of its kind in the world, has been preserved over the centuries, hidden away in the French countryside during the war, reassembled now in the Museum, and brought to light at last by Celanese. The collection includes carefully authenticated documents, historic commemorative fabrics, rare tapestry designs and thousands more—all as yet untouched for commercial use. Celanese has been privileged to take exclusive photographs of these treasures and will make them available to converters for translation into fabrics with Celanese Contemporary Fibers. And we will back these fabrics in '62 with every promotional resource at our command. This promotion is of immediate importance to you. Be sure you're planning a wide range of fabrics with Celanese fibers. There'll be a tremendous demand. And call on our representatives at any time to work with you on new weaves and constructions. Celanese Fibers Company, 522 Fifth Avenue, New York 36 (a division of Celanese Corporation of America). Celanese®

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(1) The percentage of textile mills using each of 87 products.

(2) Annual dollar purchases by textile mills of each product.

(3) Buying influence of TEXTILE WORLD readers on each of these products.

Not part of this report, but we will be happy to furnish titles of TEXTILE WORLD readers who influence the purchase of each of these 87 products.

There you have the story. Your next step is to call your TW District Manager or send your request to us on company letterhead for your copy.

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TEXTILE WORLD

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TEXTILE WORLD

Market Research Report

SECTION 1 Annual Purchases and the Percentage of Textile Mills Using Each of 87 Products

SECTION 2 Buying Influence of Textile World Readers on Each of 87 Products

The 87 Products Are Grouped Under The Following Categories:

- Air Conditioning, Humidifying, Heating & Ventilating
- Building, Building Materials & Services
- Electrical Equipment
- Employee Safety & Sanitary Equipment
- Employee Services
- Instruments & Meters
- Lubricants & Lubricating Equipment
- Materials Handling
- Maintenance Equipment & Supplies
- Packaging & Shipping
- Power Generation & Services
- Power Transmission
- Production & Maintenance Control Equipment
- Production Equipment & Supplies
- Other Equipment or Supply Items
- Trucks and Parts

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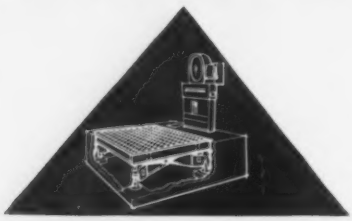
...CUT COSTS AND SAVE TIME WHEN WEIGHING MATERIALS ON POWER OR HAND TRUCKS

FAIRBANKS-MORSE WAREHOUSE SCALES



Self-Contained Scales

- For general use in factories, warehouses, shipping rooms, foundries, paper mills and other industrial applications.
- Thirty different models for your special requirements ... with direct-reading "Floaxial" Dials, with or without "Printomatic" weight recorder or with Double Beam. Capacities from 600 lbs. to 3200 lbs.
- All models feature the F-M Type "S" Lever System—a suspension system that swings parallel to the direction of traffic ... thus protects scientifically ground pivots and bearings ... results in accuracy that lasts for longer periods of time.

Built-In Floor Scales

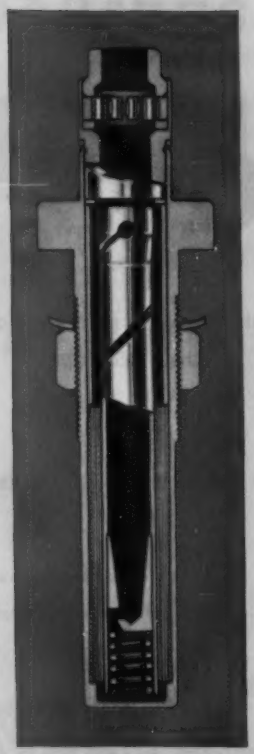
- Especially designed for heavy-duty use in metal working plants, steel mills, paper mills, textile mills, mines ... and for general factory use.
- Available for installation in a pit or suspended from the floor, with direct-reading "Floaxial" Cabinet Dial, with or without "Printomatic" weight recorder, or Double Beam. 20 different models with capacities up to 10 tons.
- All models feature the F-M Type "S" Lever System for complete accuracy over longer periods of time.

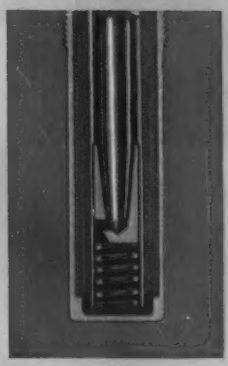
For complete information on any or all Self-Contained and Built-in Scales, write: **C. G. Gehringer, Marketing Director, Scale Division; Fairbanks, Morse & Co., 100 Electra Lane, East Station; Yonkers, New York.**

FAIRBANKS MORSE

A MAJOR INDUSTRIAL COMPONENT OF

FAIRBANKS WHITNEY





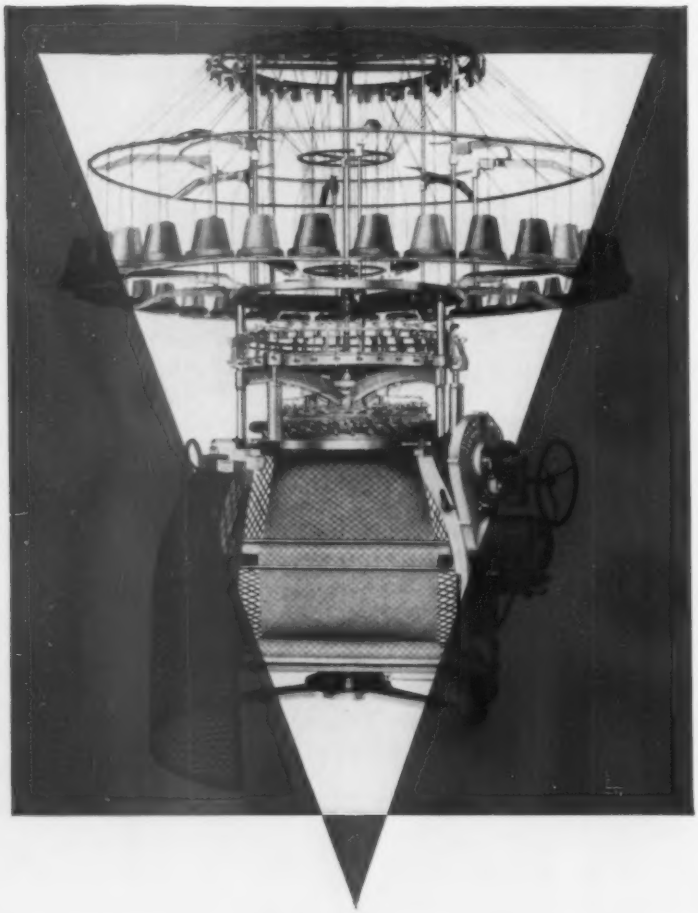
DA42

The Draper DA-4-2 Anti-friction Spindle is designed to run at higher speeds with heavier loads and lengthened oiling cycles. This spindle can be furnished to handle a full range of counts in both filling and warp yarns. The DA-4-2 Spindle features a one-piece steel base and a roller bearing bolster with coil spring dampening action. For the finest in spinning combinations, specify — Draper Bobbins, Rings and Spindles. For information, consult a Draper representative.

DRAPER CORPORATION

HOPEDALE, MASS. • ATLANTA, GA. • GREENSBORO, N.C. • SPARTANBURG, S.C.

SUPREME



Double-Pique Fabric Up To 20 Yards Per Hour

Other Fabric Up To 40 Yards Per Hour

Write for free booklet on this important advance in the interlock field

UNEQUALLED VERSATILITY

30" dia., 36 feeds in cuts through 16 needles per inch—produces "Double Pique" and "Grenadine" fabrics; "Blister" stitches, plus a tremendous range of other patterned rib or interlock.

50% GREATER PATTERN AREA THAN ANY OTHER MACHINE

Plus a spectacular range of patterns and textures. Wheels available for special pattern fields, (L shaped, argyles, etc.).

SOME OTHER MODELS IN THE SUPREME LINE OF PROFIT-KNITTING MACHINERY—

MODEL MJ/N—Wide Diameter & Body Size Jersey

MODEL MLVP/N—Pile, Loop, Plush, Plaited Patterned and Velveteen

MODEL ROF/N—Jacquard-Type Floatless Patterns

MODEL SAI-PP—Striped and Patterned 1 x 1 Rib—Also Swiss Rib and Interlock

MODEL SAAF-C/N—Plain, Variable Striped and Patterned Jersey

MODEL BRW—1 x 1 and Half Cardigan Plain and Patterned Bulky Fabrics

MODEL IRW-2

Unsurpassed Versatility In

"DOUBLE-JERSEY" "DOUBLE-KNIT"

Rib And Interlock Production

For further information or a demonstration of this machine in action, contact Supreme.

SUPREME
KNITTING MACHINE CO., INC.
94-02 104th STREET, OZONE PARK 16, N. Y.
Southern Representative and Showroom
Monroe Machinery Sales Co.
P.O. Box 342, MacArthur Circle, Monroe, N. C.

SIMPLIFIED CONTROLS

Easily adjusted to control both fabric elasticity and surface "birds-eye" effect. Can be readily set to produce pique fabrics in Swiss, French or other constructions.

DUAL RACEWAY

Needles of either raceway may be independently set in knit to tuck or knit to welt positioning.

AVAILABLE WITH

(1) "ROLL-O-MATIC" FEEDING DEVICES —Permit use of wide variety of yarns—Maintain uniform tension at knitting points, (2) VARIABLE SPEED MOTOR—For R.P.M. changes at the turn of a lever.

Plus All SUPREME Standard, Mill-Proven Construction Features

CII-109

The cone nose... *how important?*

It is extremely important — in fact, it is one of the *most important* features of a cone. The correct nose insures free delivery of the yarn and this means a savings to you. Over the years Sonoco has devoted continuous research to perfect this one feature because it is essential to have the right "nose" *matched* with the yarn and processing conditions.

For example, the Regular or Crimped Round Nose is satisfactory in most instances, however the Straight Round Nose was developed for yarn with high moisture content and where relative humidities are excessive. There are varying degrees of crimping and rolling which permit a variety of sizes of holes in the cone "nose". "Plain Point" is a square cut "nose" not machined in any way. All "nose" types can be lacquer tipped, giving them a smooth, hard, moisture-resisting surface and a positive means for yarn identification. Dyes can also be applied for identifying purposes.

Continuing technical developments of this type, plus the consulting services of qualified sales engineers, provide an extra ingredient of quality representing more than 60 years of progress. *Only Sonoco,* in its field, provides the research and integrated manufacturing facilities required to serve the textile industry. *Let Sonoco experience help you!*

SONOCO

Products for Textiles

sonoco

2097

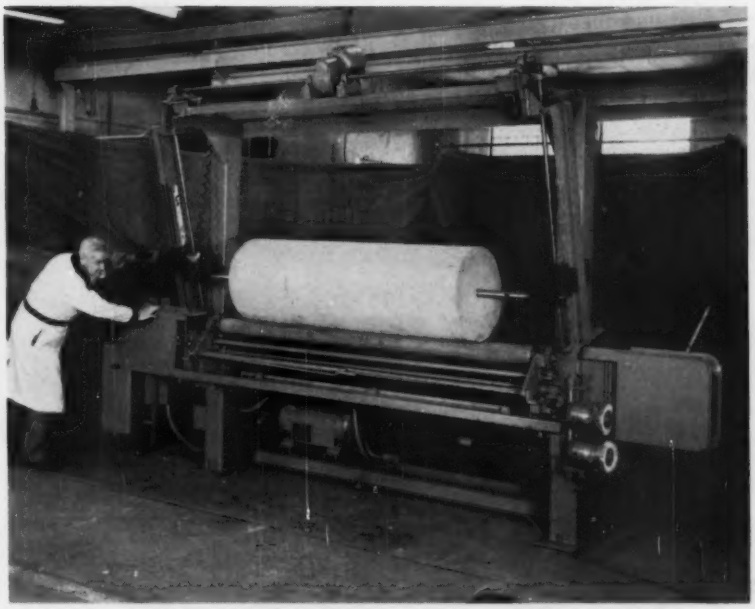
SONOCO PRODUCTS COMPANY, HARTSVILLE, SOUTH CAROLINA • Mystic, Conn. • Akron, Ind. • Ravenna, Ohio • Lowell, Mass. • Holyoke, Mass. • Phillipsburg, N. J. Longview, Texas • Philadelphia, Pa. • La Puente, Calif. • Fremont, Calif. • Atlanta, Ga. • Richmond, Va. • **MEXICO:** Mexico, D. F. • **CANADA:** Brantford, Ont. • Granby, Quebec

For more information on any of these items, circle appropriate number on the Reader Service Card, next to the back cover.

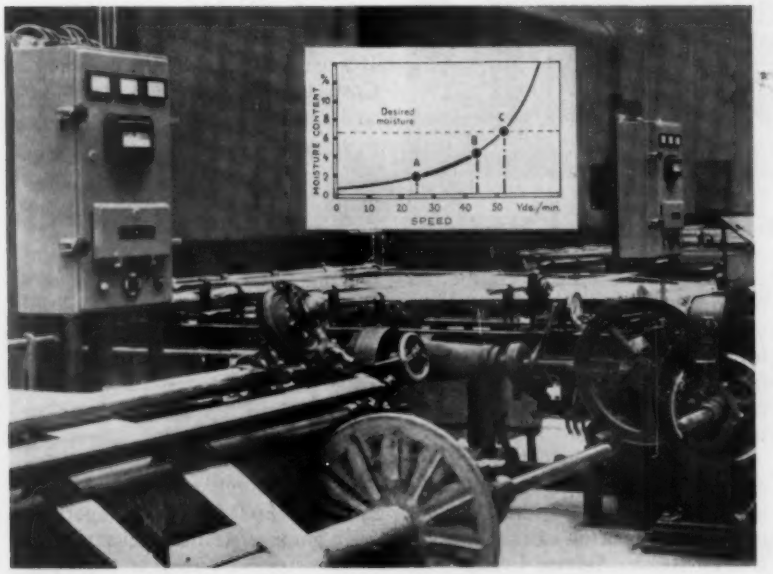
Now—Continuous Paring for Polyurethane Logs

A circumferential paring machine, developed by Falls Engineering & Machine Co., makes continuous sheets of polyurethane foam for fabric laminations. Unit takes foam logs up to 84 inches wide by 40 inches in diameter. It makes sheets as thin as $\frac{1}{32}$ inch. Because the paring machine has a variable-speed drive, it adjusts from 1 to 320 fpm.

Rectangular logs are rounded on the unit. Then the log is rotated into the cutting head, producing a foam sheet. Winding on paper tubes is controlled by an independent variable-speed drive. Therefore, the foam sheet is not stretched. A splicing unit is available as optional equipment. It fits on the parer and makes heat-sealed splices for continuous rolls of foam from two or more logs. **(Circle E-1 on Reader Service Card)**



Moisture Meter Controls Slasher Drying Speed



With this moisture meter you can eliminate overdrying, increase output, and lower steam consumption. The Textometer, made by Mount Hope Machine Co., measures moisture by electrical conductivity. Its sensing elements are mounted on a bar near the end of a slasher dryer or just beyond the tenter frame. If the residual-moisture content is too high, the control slows the dryer. Or if it's too low, the drying speed is increased automatically.

When the dryer is idle, the control unit shuts off automatically. At startup, when moisture content is low, the unit forces the machine to run at higher speeds until the fabric reaches the desired moisture level. **(Circle E-2 on Reader Service Card).**

. . . Turn the page

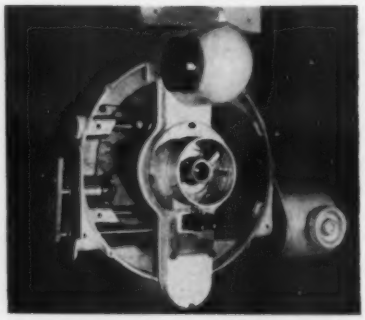
For more information on any of these items, circle appropriate number on the Reader Service Card, next to the back cover.

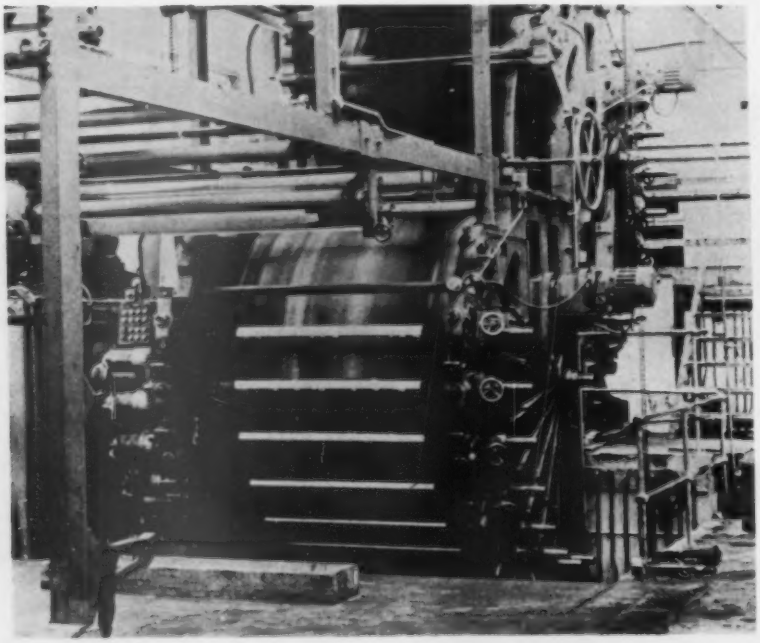
Bobbin Builder Eliminates Winding and Quilling

Here's a new approach to the problem of putting yarn on spinning bobbins with uniform tip and filling bunches. Called Bild-O-Matic, it's a bobbin building motion for spinning frames that makes quills suitable for use in Draper magazines.

The unit, made by Southern Machinery Co., eliminates winding, spooling, quilling, and battery filling. And there's no limitation as to the yarn numbers that can be spun. It fits any warp or filling spinning frame.

The unit is self-contained and easy to install. You simply bolt the three-holed frame into position. The heart of the Bild-O-Matic is the cam. But special gearing also plays an important part in the role of making uniform length tip and feeler bunches. It eliminates backlash from worn spinning-frame parts. **(Circle E-3 on Reader Service Card)**





Prints Both Sides in One Pass

Duplex printing machine, designed by Woods' Engineers Ltd., prints fabrics in 8 colors on each side or 16 colors on one side. It uses two 8-color printers in tandem. One is set in a pit below floor level, the other is elevated behind the first.

Fabric passing through the first unit is printed on the back. Then without turning, the material goes to the under side of the elevated unit printing the face. A new drive eliminates backlash. Pushbutton control adjusts each print roll individually. This combination makes for perfect-color registration, even for front-to-back fit. Print register can be adjusted while in full-speed operation.

Duplex printing machine operates at maximum speed of 75 ypm. with up to 56-in. wide fabric. Unit can print many types of fabrics. **(Circle E-4 on Reader Service Card)**

E-5—Proportional controller gives accurate, proportional, off-on process control with a minimum of cycling. Unit receives process information from a primary control (such as indicators). It converts this information to an operating signal that controls relays connected to the process. Controller works for most control operations—temperature, pressure, and liquid level. Thermo Electric Co., Inc.

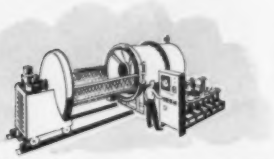
E-6—Filter for fluorescent light takes out ultraviolet rays, therefore eliminates glare, fabric fading, and fiber degradation. This filter, called Infropake Filtersleeve, is used with any high-intensity fluorescent light. It is available in all sizes. Infropake Corp. of America.

E-7—Production-control system, called Shoptrol 3100, is an automatic production-monitoring and data-collection system. A central-control panel holds 160-work-station monitors. Each monitor is a 6-digit counter for every control station. Each operator is in direct contact with the production controller through an operator-control station. System keeps inventory up to date, speeds scheduling, and accumulates piece work and payroll data. Manual reporting is decreased. System assists finance and personnel planning. General Electric Co.

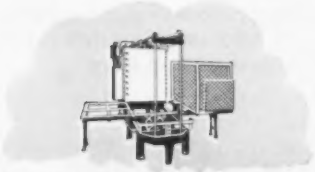
. . . *Turn to page 124*

NEW

Now it is possible to set fibers at negative pressures. Accurate fiber setting at temperatures below atmospheric can be achieved as a result of new processing techniques developed by Turbo research engineers. Newest units in field operating successfully.



Turbo's FS-1000 for carpet yarns processes up to 2000 lbs. per hour. Keeps relative humidity up, temperature under the boil. Better shrinkage control than with earlier water-setting techniques.



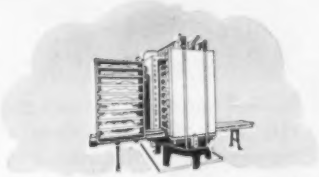
The Turbo FS-300, with basket carriers, sets yarns at 300 lbs. per cycle. Eliminates dry heat problem by keeping humidity up, temperature down.

Every day, more and more synthetics require heat setting. Turn to Turbo, and let automation solve your problems. On Turbo Automatic Fiber Setters, push-button controls guide the entire setting operation.

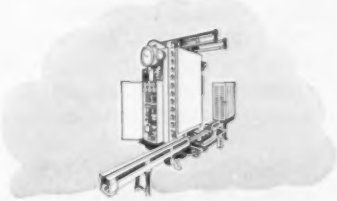
Alternating cycles of steam and vacuum eliminate air and moisture pockets to provide fast, thorough penetration even at the center of material being processed. Cycling can be provided to allow any combination of pressure and vacuum.

Turbo Fiber Setters, with capacities from 60 to 1000 lbs., are available with a variety of carriers: Tray-type for sweaters; cans for tow or sliver; baskets for carpet yarns, and skeins; bobbin carriers for cones or spools.

See them in operation at Lansdale . . . push the buttons yourself! Call ULysses 5-5131, or write today for an appointment.



The Turbo FS-96 processes 9 dozen sweaters per hour, or 200 lbs. of fiber per hour based on 20 lbs. per can.



The Turbo FS-60 sets up to 120 lbs. of synthetic fibers per hour.

TURBO

TURBO MACHINE COMPANY, LANSDALE, PA.

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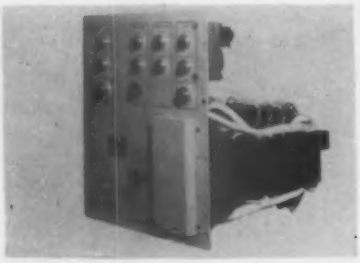
For more information on any of these items, circle appropriate number on the Reader Service Card, next to the back cover.

E-8—Label printer makes pressure-sensitive labels automatically. Unit operates at 110 labels per minute. Label size, color, and shape can be changed on the job. The rubber copy plate is changed in 30 seconds, ink color or cutting dies in 1 minute. Adhesive Label Corp.

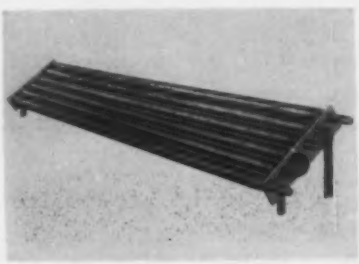


E-9—Controller produces a uniform mix while reducing waste and increasing production. Unit operates from a punched card programmed for any batch formula. Controller is particularly useful for batching operations where formulas are made from varying combinations of the same chemicals. Instrument controls loading of ingredients in any quantity from drops up to tons. Control Equipment Corp.

E-10—Narrow-aisle truck, called VST Transveyor, works in 6-ft. aisles. Control handle includes three speeds forward and reverse, plus lifting and lowering of the forks. Capacities available are 2,000, 3,000, and 4,000 pounds. Automatic Transportation Co.

E-11—Tape punch and tape reader handle 100 characters per second. These units, operating as a matched pair, are designed for high-speed message- and data-handling communications. The tape punch (BRPE) comes in two types: one for 5-level code, the other for 6-, 7-, or 8-level code. Unit weighs 28 pounds. The tape reader (CX) adjusts to 5, 6, 7, or 8 levels. It weighs 12 pounds. Teletype Corp.

E-12—Pneumatic transmitter features a liquid-filled, diaphragm-sealed design. It has hydraulic overrange protection to static pressures of 1,500 psi. A replaceable diaphragm isolates all parts from corrosive fluids. Output is 3 to 15 psi. Taylor Instrument Co.



E-13—Tank heater, horizontal type, gives 223 square feet of heating surface. Aluminum fins, set six to the inch, are ⅝ inch high by 0.03 inch thick. These fins have a higher heat-transfer coefficient than steel. Heaters weigh 170 pounds. Griscom-Russell Co.

E-14—Pressure regulator features accurate control and tight shutoff. Unit comes in ductile iron or bronze in ¼-, ⅜-, ½-, or ¾-in. sizes. Pressure control ranges from 0.5 to 125 psi. This pressure regulator works on steam, water, oil, air, gas, or chemicals. Gate seats are stainless steel and feature self-cleaning and self-lapping construction. Unit is suitable for 250-psi. use at 500 F. OPW-Jordan.

E-15—Drum handler comes with a dumping attachment that makes the unit a complete drum-handling system. Unit performs all operations —moving, lifting, pouring, and stacking. Attachment lifts and rotates up to 800 pounds in 30- or 55-gal. drums. Pouring heights range from 0 to 122 inches at a 45-deg. angle. Unit is manual or power-operated. Crown Controls, Inc.

. . . *Turn to page 126*

MICROROK

HAVE YOU LOOKED INTO THE

- **Uniform Extraction**
- **Uniform Penetration**
- **Long Life — measured in years**

MICROROK® combines the best properties of metal rolls with the best properties of rubber rolls. It combines hardness and smooth finish with the resiliency of rubber. It gives outstanding life between grinds, thus reduces your maintenance costs. Microscopic depressions in the surface, which looks mirror-like, aid in gripping fabric and preventing slippage.

For the MICROROK catalog page containing complete technical information, see your S-W Sales Engineer.

STOWE-WOODWARD, INC.

Ask the man from S-W . . .

. . . about the excellent wear-resistance qualities of **MICROROK** covers. Heat resistance this cover offers, too, up to 180°F. Padder, Mangle, Washer, and Carbonizer Rolls give long service life when their covers are **MICROROK.**

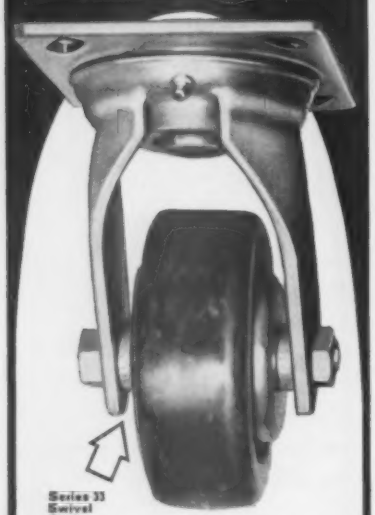
Literally hundreds of **MICROROK** Rolls are proving daily that they are the most versatile hard rolls in use today. This and other factors mean cover longevity which you may not be getting. Ask your S-W man for the facts.

STOWE-WOODWARD, INC.
Newton Upper Falls, Mass.
Neenah, Wisconsin
Griffin, Georgia

on the West Coast

HUNTINGTON RUBBER MILLS, INC.
Seattle, Washington
Portland, Oregon
Port Coquitlam, British Columbia, Canada

THREAD GUARD
Casters
for the
TEXTILE INDUSTRY

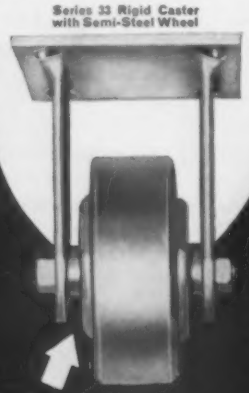


Series 33 Swivel Caster with floor protective Texite Wheel. Note extra clearance for easier cleaning.

Designed especially for maintenance-free Textile mill application, the economical new Albion Series 33 casters offer a smooth, wide-spaced fork with close-fitting pressed steel thread guards around the wheel hub. Spacer tubes fitted between the fork legs and thread guards provide ample clearance for easy cleaning without dismantling. The new Series 33 is stocked in 4", 5" or 6" swivel and rigid models with choice of semi-steel or Texite wheels. Special sizes and/or features also available.

Call today—for full information, specifications and surprisingly low prices on the new Series 33.

Series 33 Rigid Caster with Semi-Steel Wheel



ai ALBION INDUSTRIES, INC.
Albion, Michigan

Equipment & Supply News

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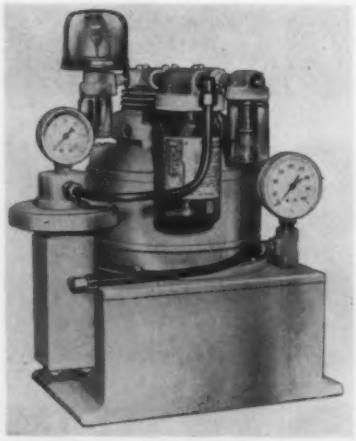
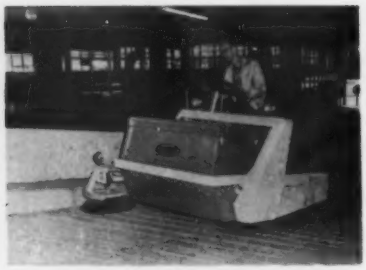
For more information on any of these items, circle appropriate number on the Reader Service Card, next to the back cover.



E-16—Web guide, Model PH-55, uses a hydraulic-power cylinder of 15-ton capacity to shift roll of material and re-align the web. Unit works on textiles, rubber, plastic, paper, and other web materials. Tolerance: ±0.01 inch. Stanford Engineering Co.

E-17—Substation combines compact size with capacities for up to 500, 3-phase kva. Unit takes primary voltages up to 4,800 and secondary voltages up to 600. Also available is a unit with a forced-air cooling system that increases the kva capacity by one-third. Special design permits use of various components—meters, air interrupter switches, circuit breakers, molded-case feeder breakers, and fusible feeder switches. This substation operates quietly, making it suitable for areas where transformer noise would be disturbing. Square D Co.

E-18—Slip and antistick compound now comes in 16-oz. aerosol can. Uses include dry cans, chutes, conveyors, bearings, belts, and gears. Product forms a nongummy film with a coefficient of friction as low as 0.07. It is stable at temperatures up to 500 F. Dixon Corp.



E-19—Power sweeper cleans a 53-in. path, even on a steep ramp. Unit comes with a 12-cu.-ft. hopper that holds up to 800 pounds of debris. With a side brush that sweeps right up to the wall, the unit measures 56x85½x50 inches. G. H. Tennant Co.

E-20—Blower, featuring aluminum housing and wheel, is used for exhaust or air supply. It comes in four sizes—350, 530, 825, and 1420 cfm.—and four discharge positions. Blower exhausts fumes and smoke or supplies air to burners and furnaces. It is also used for cooling electronic equipment. Aluminum wheel is self-cleaning. Cincinnati Fan & Ventilator Co.

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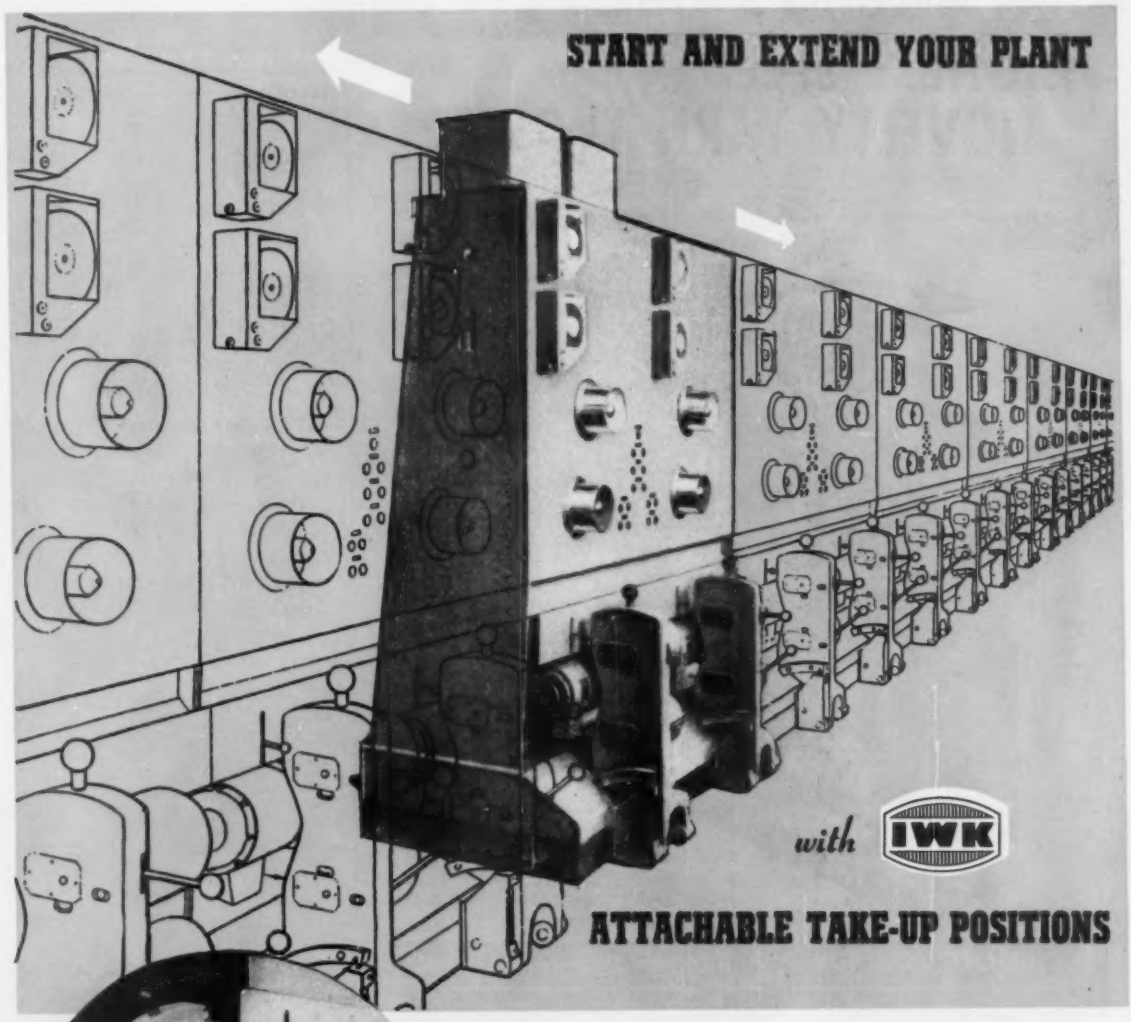
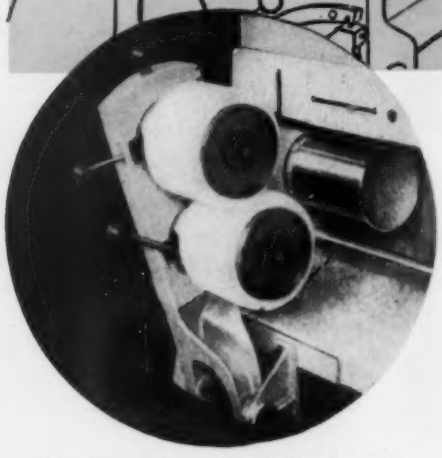
Synthetic Fibre Production





Tandem arrangement of bobbins for doubling the production.

Optional extension of the machine to the left or to the right by attaching further take-up positions.

Space-saving design. The main drive is separate from the machine, with the whole range of spinning heads being available for the take-up positions.

Individual stopping of each thread. Friction roller, traverse and godet wheels of each take-up position are driven by individual motors.

High traverse speed for extreme thread speed with smoothly operating machine.

Take-up positions available also in double-sided design according to the arrangement of spinning heads.

Please ask for manufacturing programme on our Chemical Fibre Machines.

INDUSTRIE-WERKE KARLSRUHE Aktiengesellschaft · KARLSRUHE

Exclusive Distributors **NATIONAL INDUSTRIAL MACHINERY CORPORATION—Suite 5119—Empire State Building**
350 Fifth Avenue, New York 1, N. Y., U. S. A.

NEW from FLETCHER

HIGHEST SPEED NOVELTY YARN TWISTER EVER MADE

This Novelty Yarn Twister, which operates at a speed of 5,000 to 9,000 RPM, depending on the type of yarn used, is a Fletcher achievement in engineering that speeds your production.

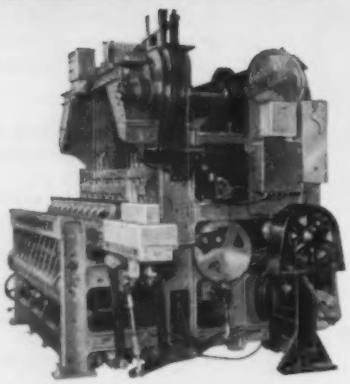
Sizes range from 13-foot, 20-spindle model up to 33-foot, 100-spindle model.

Dual feature—this machine not only twists yarn but serves as a high speed doubler twister. It does standard twisting up to 8 ends.

TRY BEFORE YOU BUY with 3-month trial rental plan

Get proof before you pay by evaluating these machines in your own plant. They are available for delivery, completely assembled. See them in operation in the Fletcher Industries Showrooms in Cheltenham, (Philadelphia) Pa.

NYLON AUTOMOBILE SEAT BELT LOOM



This loom is made specifically to meet the fast-growing demand and to overcome the shortage of equipment for the manufacture of automobile seat belts.

Fully equipped and erected **$5,000**

FLETCHER INDUSTRIES

Hasbrook Avenue and Beecher St., Cheltenham, (Phila.) Pa.

FLETCHER SOUTHERN — SOUTHERN PINES, N. C.

FLETCHER INDUSTRIES — STATESVILLE, N. C.

Equipment & Supply News

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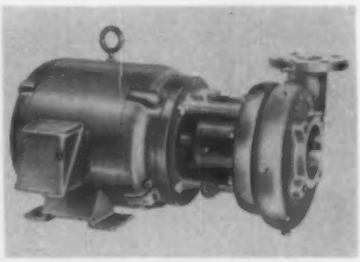
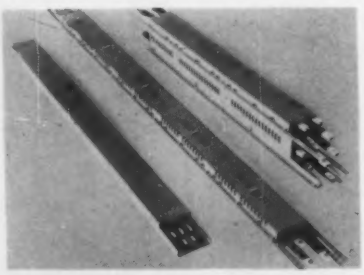
For more information on any of these items, circle appropriate number on the Reader Service Card, next to the back cover.



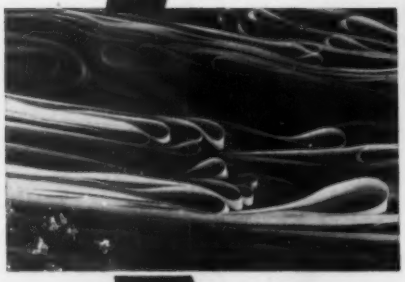
E-21—Suction pump features a close-coupled end suction for fast installation with space savings. Capacities go up to 1,600 gpm., heads to 330 feet. Uses include air-conditioning systems, cooling towers, boiler feed, and general service for chemicals. Aurora Pump Div.



E-22—Busway, light in weight, uses polyester and aluminum bus supports. Polyester supports are stronger than ceramic and they don't chip or crack. A 600-amp., 3-pole unit, 10 feet long weighs only 55 pounds. It's available in 60- to 4,000-amp. ratings. The fully enclosed source of power has plug-in connections. Outlets feature a mechanical interlocking safety device. For maximum insulation safety, the bus tars are double wrapped with varnished-cambric and polyvinyl-chloride tape. Electric Distribution Products, Inc.

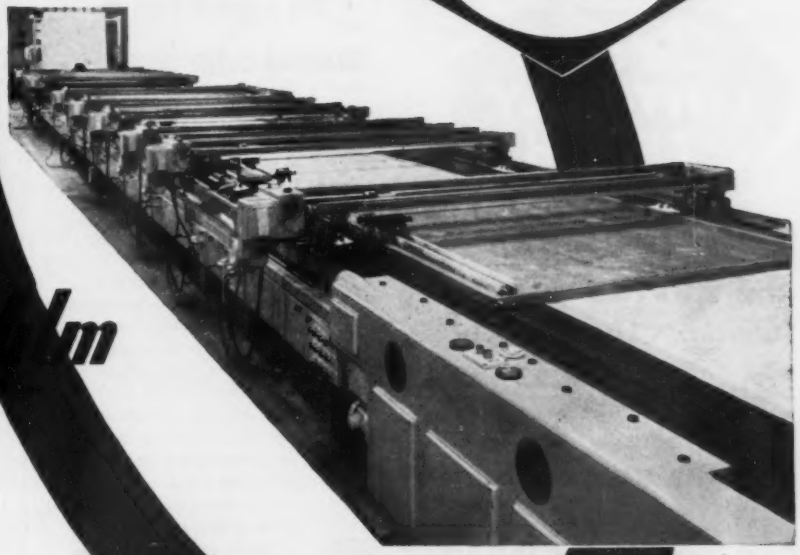
E-23—Truck loader picks up flush-bottom cases weighing up to 1,000 pounds. Complete operation is controlled through the steering handle. Unit lifts cases up to 6 feet long. Truck has a built-in floor lock to hold the truck on inclines. Stokvis Multiton Corp.

. . . Turn to page 130



OUR MACHINES HAVE PERFECTED OUR FABRICS

OUR FABRICS HAVE PERFECTED OUR MACHINES



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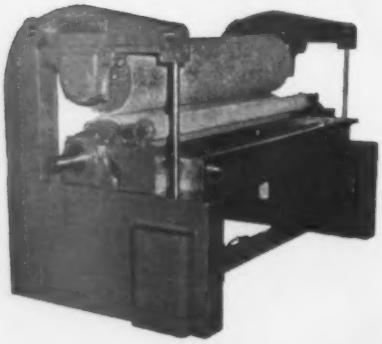
J.E. CARROLL & CO.

HEAVY DUTY
PNEUMATIC PADDER



• New and improved operating features include equalized pressure control, spherical roller bearing roll mounting, welded steel frame construction. Available with several optional features. Other models to choose from. We sincerely solicit your inquiries.

CYLINDER DRYERS • PADDERS • COOLING CYLINDERS • DYE TANKS

J.E. CARROLL & CO. LOWELL, MASSACHUSETTS

CIRCLE 252 ON READER SERVICE CARD

Out Goes
LINT · FLY
TRASH
from your
SPINNING FRAMES
and ROVING FRAMES
Quickly • Economically

by using
M·B AMOSKEAG PNEUMATIC ROLL PICKER
New, Improved MODEL 59

A pneumatic tool especially designed for the specific purpose of REMOVING LINT and FLY from the top rolls of Spinning Frames and Roving Frames. Saves time and does a better job by substituting mechanical cleaning instead of laborious hand methods. Air deflector prevents fly and lint being blown into yarn when spinning. Adjustable valve permits any desired spindle speed.

Write for Literature

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The biggest step in business... the short distance from the middle to the top

Companies are still canvassing colleges like crazy for bright young engineers and technologists...

But what about the man with ten or more years invested in his company? Here he is, ready to take on heavier responsibility. How much longer must he wait?

Upstairs in his company, management will tell you their biggest job is finding new top talent. And what they are seeking most in a man is something more than just his proficiency in his post.

They're seeking an alertness to all phases of the business... long range planning, policy-making, new product development and research ... breadth as well as depth.

The men who edit this particular McGraw-Hill publication for you, recognized this responsibility long ago. They answer it in these pages. Here, is the perspective you need to push ahead. And as you read, keep reaching, for...

Men who read more... earn more!

Equipment & Supply News

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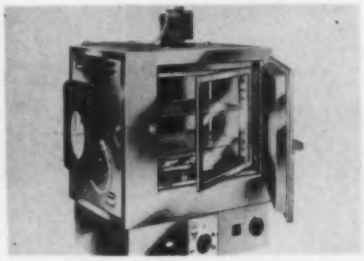
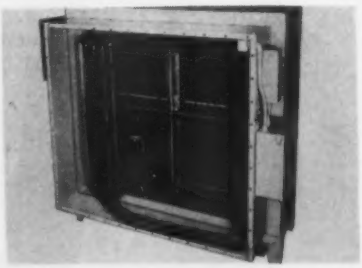


E-24 — Relative-humidity cabinet handles a 25- to 65-C. temperature range with ±1% tolerance over the full range. It is available in four sizes ranging from 14x13x14 to 37x 19x25 inches. Unit comes with a 12-in.-dia., 24-hr. (wet and dry) recorder. Blue M Electric Co.



E-25—Air filter, Type HVSC Electro-Cell, is designed for use in inaccessible areas. It is a self-contained electrostatic precipitator and comes in 24 sizes ranging from 1,000 to 25,000 cfm. Available in floor-or ceiling-mount models, each unit has front and back duct connection and preassembled washing and oiling unit. Filter is only 10 inches deep. Efficiency: 95%. American Air Filter Co., Inc.

E-26—Floor-sweeping compound, called Pine-Ax, works on asphalt tile, rubber, cork, mastic, linoleum or wood. It contains a no-rub wax cleaner. Compound is free of oil or greasy material and doesn't contain sand or grit that could scratch the floor. Paxson Mfg. Co.

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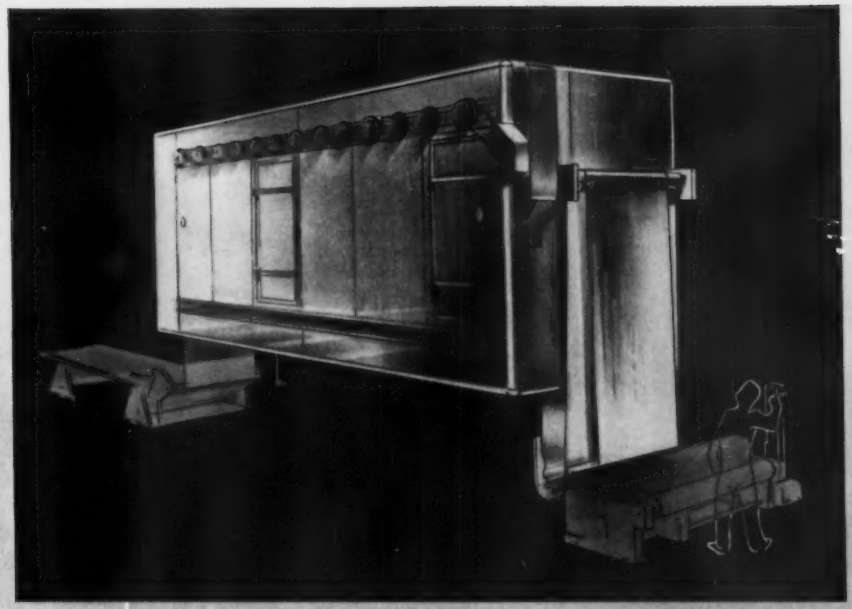
THIS IS "NATIONAL"...



Amazing versatility engineered into a ROLL DRYER and CURER to provide complete adaptability to any desired production-line range. Modular construction. Highest evaporative capcities. Extremes in tension control.

"NATIONAL" Guarantees *Greater Value*—through:

- A full analysis of your drying problem by a team of experts.
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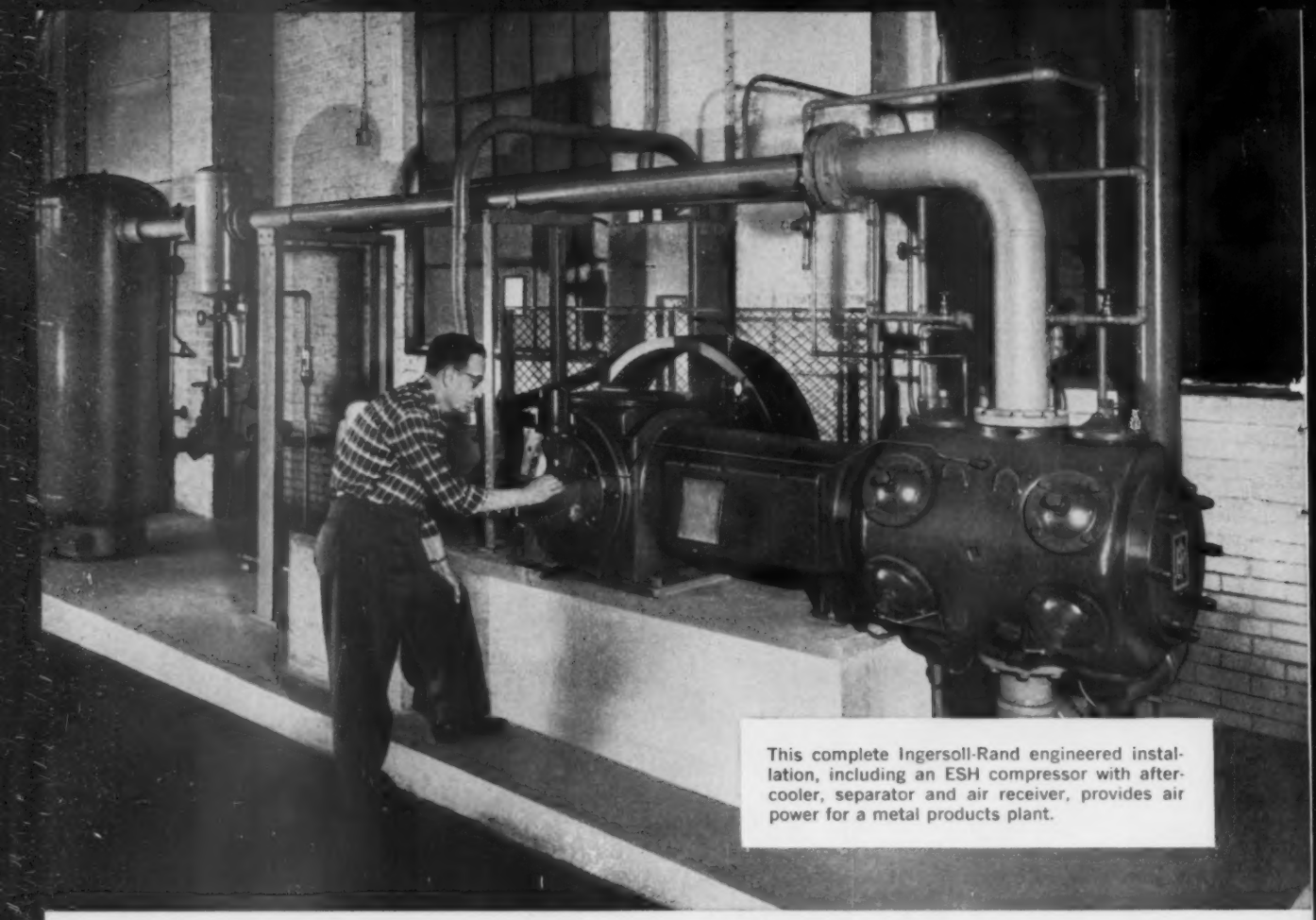
FORTY-FIRST YEAR • INSTALLATIONS AROUND THE WORLD

CIRCLE 131 ON READER SERVICE CARD



This complete Ingersoll-Rand engineered installation, including an ESH compressor with aftercooler, separator and air receiver, provides air power for a metal products plant.

Here's why

TIME TELLS THE DIFFERENCE

in Ingersoll-Rand compressors

"No bearing wear in 60,000 hours"..."43,680 hours with no valve maintenance required"..."63,648 hours with no forced maintenance"..."13 years without even *cleaning* the valves". That's what our customers have been telling us, and there are many more true case histories like them which prove the *long-range economy* of Ingersoll-Rand compressors.

The *extra value* that's built into every type of Ingersoll-Rand compressor pays off with reduced maintenance and attention over many years of operation, and the result is big savings in the cost of your air power. Ingersoll-Rand offers also the *most complete* line of compressors, in reciprocating, centrifugal, axial-flow, rotary and thermal types. There are units from ½ to 25,000 hp, for pressures from one micron to 125,000 psi. Call your I-R man today for help on your job.

ESH	PHE	XLE	PRE	HHE	XPV
20 to 150 hp	75 and 100 hp	125 to 350 hp	400 to 2000 hp	200 to 4000 hp	(steam-driven) 200 to 1500 hp

CIRCLE 132 ON READER SERVICE CARD

Only
Ingersoll-Rand
air compressors
give you all
these
EXTRA VALUE
features...

AIR-CUSHIONED CHANNEL VALVES
Known for high efficiency, quiet operation and exceptional durability. Entirely different. Each valve is a combination of rigid stainless-steel channels and bowed leaf springs, with trapped-air spaces which cushion action, prevent impact. Separate stainless-steel seat plate may be turned over or replaced for new life.

FULL-FLOATING ALUMINUM BEARINGS
Never need fitting or adjustment. They "roll with the punch" of each stroke, to distribute the load evenly over inside and outside surfaces.

FULL FILTERED PRESSURE LUBRICATION
Filtered oil under pressure to all bearing surfaces cuts wear to minimum.

SEALED FRAME
Keeps out dust and dirt, the major cause of wear. Keeps oil in.

and the World's
Most Comprehensive
Compressor Experience

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CIRCLE 253 ON READER SERVICE CARD

Equipment & Supply News

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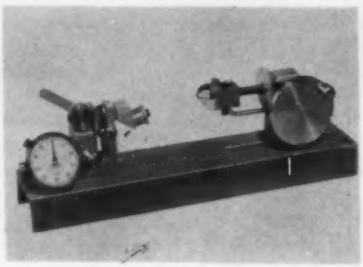
For more information on any of these items, circle appropriate number on the Reader Service Card, next to the back cover.

E-27—Timer motor features a special design with all moving parts sealed in oil. Unit offers noiseless, lifetime, continuous operation. Motor's outside diameter is $1\frac{1}{16}$ inches. Applications include computers, air conditioning, and heating appliances. Controls Co. of America.

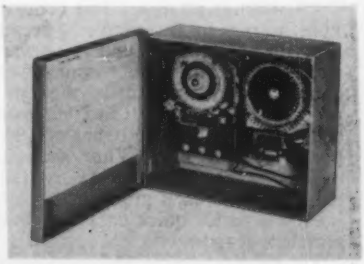


E-28—Tensile tester — for yarn, thread, and fabric—is portable. It weighs 6½ pounds. This tester, Model VTA, is available in 50- or 100-lb. load capacity. Sample length can vary from ½ to 8 inches. Indicator needle locks at maximum load. Detroit Testing Machine Co.

E-29 — Predetermining counter works photoelectric or magnetic-impulse amplifiers and linear measuring wheels. Unit controls stop-motion, cutoff actuation, or cyclic operation. It comes in 1-to-4 digit models. Counts up to 3,000 per minute. Standard Instrument Corp.

E-30—Flow-rate controller, Series 8800, handles flow control for water or air. Capacities range from 0.01 to 720 gpm. (water) or 0.2 to 2,880 fpm. (air). Unit comes in brass or 316 stainless steel with special diaphragms for corrosives. Brooks Instrument Co., Inc.

E-31—Service truck, for tools and small equipment, comes with two lockable drawers. Unit is available in two sizes: 18-x30 and 24-x36-in. trays. Construction is steel with rubber wheels 5 inches in diameter. Truck has a tubular push handle. Bay Products.



E-32—Time switch eliminates need for manual switching. It works on operations such as mixing vats and blowers. Unit controls an operation for as little as 1 second up to 55 minutes every hour. Two types are available: 5800SK for settings of 1-sec. increments and 4100SK for 1-min. increments. A manual switch is built in for control without disturbing the programmed cycle. Tork Time Controls, Inc.

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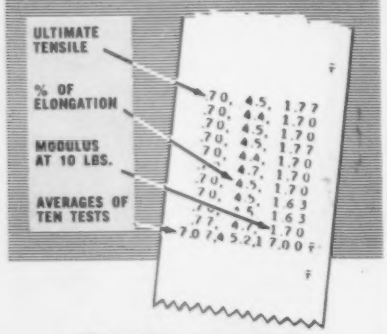
COMPLETE!
INSTANT!
AUTOMATIC!



TIRE CORD TESTING *and* RECORDING

with the Scott Model IP-4,
"SCOTAMATIC" *Inclined Plane Tester*

Here's *fully automated* textile testing and recording that can cut a big slice out of your quality control costs. Combining highly accurate digital computing devices with the Model IP-4 the "Scotamatic" Tester provides *unattended* testing of up to 200 tests per hour . . . with each test recorded instantly and permanently on tape.

"Scotamatic" operation removes human error from testing . . . permits a single operator to supervise several testers, or perform other duties. Once control settings are adjusted, the testing proceeds continuously and automatically, with tension and rate of stress precisely uniform. When samples break, stress-strain data is tape recorded, and each group of 10 tests is subtotaled for quick computation of sample averages.

Put comprehensive and economical yarn testing to work in *your* mill or lab. Write or call today for complete facts about the "Scotamatic" and other world-standard Scott Testers designed for the textile industry. Scott Testers, Inc., 95 Blackstone St., Providence, Rhode Island. Tel. DExter 1-5650 (Area Code 401).

SCOTT TESTERS

THE SURE TEST.. SCOTT!

Equipment & Supply News

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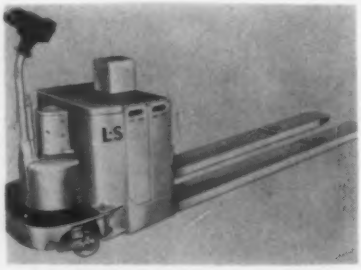
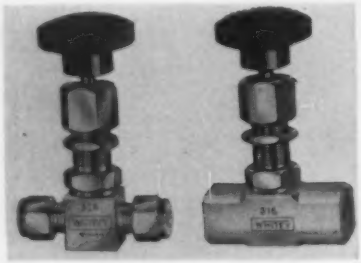


E-33—Walkie truck (rider type) handles two 2,000-lb. capacity pallets, each 48x40 inches. When used for order picking, this truck doubles operators' trip capacity. Unit operates on 12-v. batteries with overdrive or a 12-to-24 v. system. Lewis Shepard Products, Inc.



E-34—Bar-stock valves are used for ⅛- or ¼-in. tube or pipe connections. It's available in Type 316 stainless steel and Monel. Unit features panel mounting, Teflon packing, and micro-regulating or nonregulating stems. Whitey Research Tool Co.

E-35—Sweeper cleans a 40-in. path at speeds up to 5 mph. It's available in 7-hp. gas or liquefied-petroleum gas models. Turning radius is 64 inches. Unit has a main brush, 28 inches wide, and a 19-in. side brush. It comes equipped with a 250-lb. dirt hopper. G. H. Tennant Co.

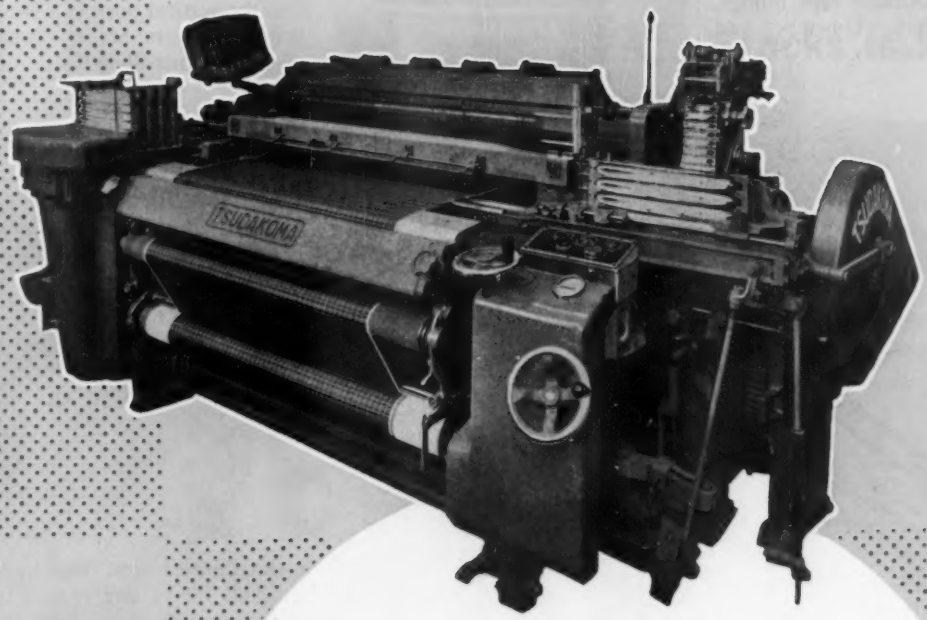
E-36—Loom winder, Unifil, is now available for looms using large quills. The unit, Model 791, winds quills up to 8¾ inches long and 1½ inches in diameter. Transfers are reduced because quills have greater capacity. It also handles 1.25s yarn. Leesona Corp.

E-37—Break-strength tester comes with adjustable speed control. Crosshead is varied by dial through a speed of 0 to 20 inches per minute. This speed control is now available on five testers from a capacity of 0 to 50 pounds up to 0 to 300 pounds. W. C. Dillon & Co., Inc.

E-38—Scrubber-polisher cleans up to 30,000 square feet an hour. In one pass, the unit puts on cleaning solution, scrubs a 45-in. path, vacuums dirty solution, and drys the floor. It can also be used for polishing and vacuuming. Machine is powered by a 7-hp. gasoline or propane engine. It has forward and reverse, with a speed range up to 185 fpm. Advance Floor Machine Co.

. . . *Turn to page 136*

Tsudakoma



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Automatic Loom and Ordinary Loom
(for Silk, Rayon, Nylon and all Synthetic Yarns)

Dobby

Preparatory Machine

Throwing Machine
High Speed Bobbin Winder
Doubling Machine
High Speed Bottle Winder
High Speed Warping Slasher
High Speed Sectional Warper
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Head Office : Kanazawa, Japan
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CIRCLE 135 ON READER SERVICE CARD 135

Equipment and Supply News

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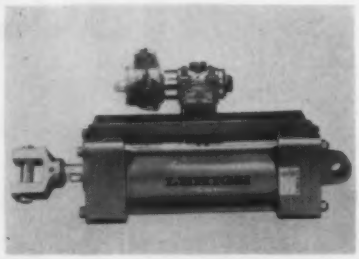
For more information on any of these items, circle appropriate number on the Reader Service Card, next to the back cover.

E-39—Plastic pipe, called Duracor, comes in Fiberglas mat or reinforced cloth. Pipe takes pressure up to 100 psi. at 250 F. Wall thickness ranges from ¼ to ⅝ inch. Also available are Duracor pipe fittings, including elbows, U-bends, and T-joints. Ceilcote Co.



E-42—Air cyclinder comes with air valve mounted on top of the cylinder for swifter, surer, controlled response. Unit features a double-acting, self-lubricating cylinder. It's available in 1½-, 2-, 3-, and 4-in.-dia. cylinders. Air Control Div., Lehigh, Inc.

E-45—Storage rack can be set up quickly and easily without bolts. The vertical pieces are integral units that come sway-braced from the factory. The horizontal beams lock into the vertical ones in a two-piece system. There are no connector pieces. Palmer-Shile Co.

E-40—Speed reducer, torque-arm type, is designed for fractional horsepower uses. It has a 25-to-1 gear ratio combined with a V-belt drive that produces speed ratios up to 175 to 1. Reducer is bored for 1¼-in. shaft. Also available in $1\frac{3}{16}$-in. bore. Dodge Mfg. Corp.

E-43 — Constant-voltage device, called Thermo Electronic, supplies 1½ to 130 volts, d.c. Operating temperature range is 0 to 60 C. This regulator replaces standard cells in potentiometer or Wheatstone-bridge instruments. Circuit has three diode stages. Thermo Electric Co., Inc.

E-46—Photoelectric counter eliminates all relays and moving parts except recorder dials. Unit is capable of counting at a rate of 1,000 items per minute. The 6-digit register is flush mounted. Unit has a pushbutton reset. Standard Instrument Corp.

E-41—Centrifugal pump is designed for general chemical and process service. Unit handles corrosive and noncorrosive liquids. Three models are available from ¼ to 50 horsepower. Capacity goes up to 1,000 gpm. with up to 240-ft. heads. The pump casing uses a vertical-split design with flanged suction and discharge connections. Unit comes with oversized ball bearings that are oil-mist lubricated. Ingersoll-Rand.

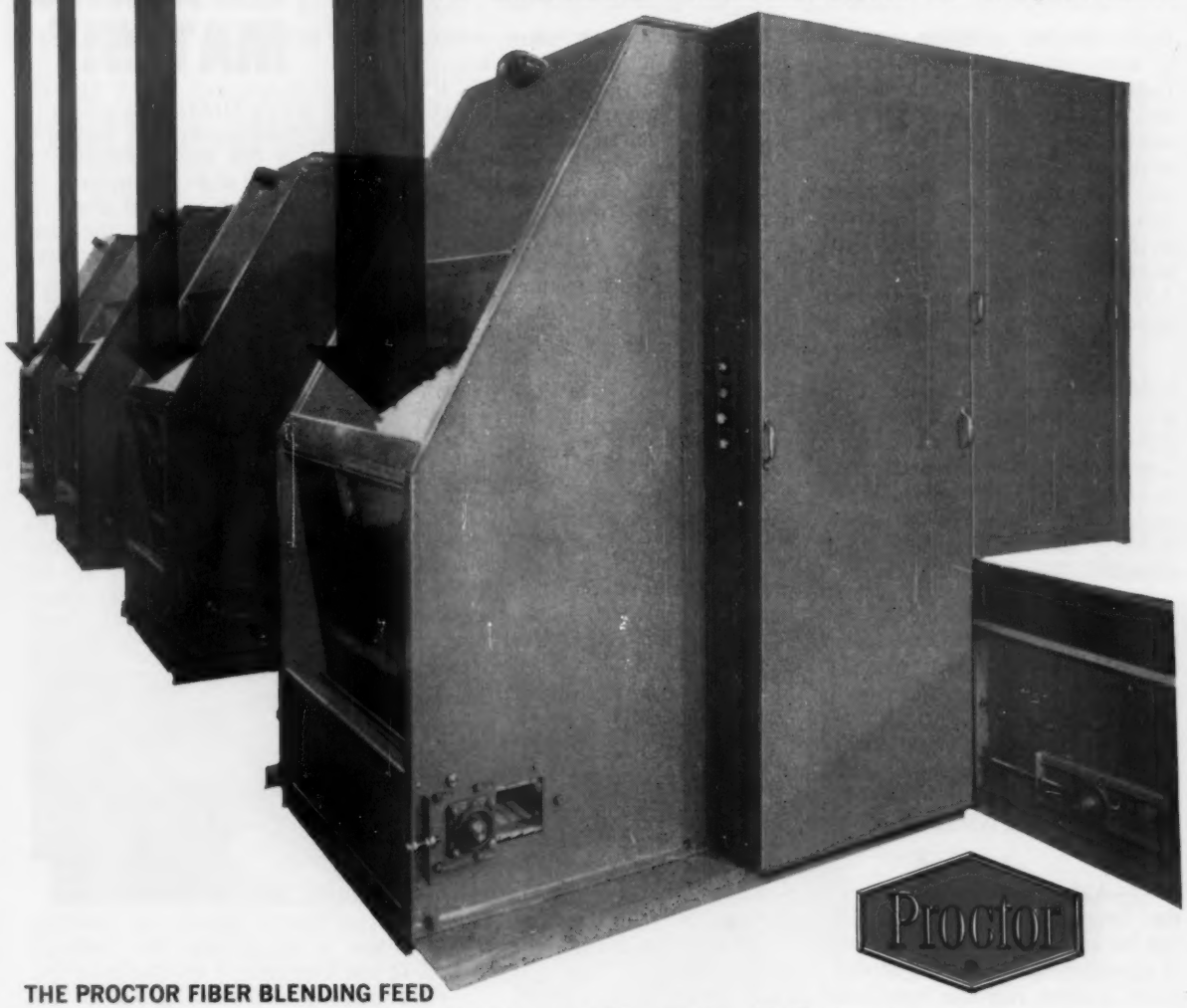
E-44—Container makes small items adaptable to pallet handling. Unit has side gate that opens for stock removal even while in a stack. Load capacity is 500 pounds. Container measures 32x20x16 inches and weighs 38 pounds. Union Steel Products Co.

E-47—Pyrometer for use with base-metal thermocouples also works as a millivolt meter. Unit has three scales: 32 to 2400 F., 0 to 1370 C., and 0 to 50 millivolts. Scales are 3½ inches long. Temperatures are read directly when you use chromel-alumel (type K) thermocouples. For other type thermocouples, conversion tables apply. Unit is mounted in a sturdy case that measures 5.58x 4 inches. Edmund Scientific Co.

. . . *Turn to page 138*

UNIFORMITY

of Blended Fiber Stocks Is Important



THE PROCTOR FIBER BLENDING FEED accurately weighs and proportions baled stocks. It's automatic. It saves labor. It reduces cost. It improves uniformity of product.

Two or more of these feeds combined with a floor apron, picker and condenser make a complete, simple and effective blending unit. Each feed has its own self-contained control units and is completely enclosed. No extra controls to buy. Each accurately weighs up to 10 dumps per minute. Each can be operated manually or automatically.

The Proctor Blending Feed assures better opening of fibers by the self-stripping rotary pin beaters on the hopper side and on the delivery side of the spike apron.

The Proctor Fiber Blending Feed is one of 3 new high-production feeds: #729B Blending Feed, #729C Card or Garnett Feed, #729P Picker Feed.

Bulletin #459 completely describes the new Proctor Blending Feed. Send for your copy. There is no obligation.

PROCTOR & SCHWARTZ, INC., 7th Street & Tabor Road, Philadelphia 20, Pa.

CIRCLE 137 ON READER SERVICE CARD 137

E-48—Speed reducer, with a double-reduction worm and gear design, comes in ratios ranging from 25 to 1 and 3,600 to 1. Seven sizes are available with torque capacities of 22,700- to 145,000-in. pounds. Housing is cooled by a fan. Cleveland Worm & Gear Div.

E-49—Flexible coupling operates in water, oil, and mild chemicals. Outside collar and inside sleeves are hot-dipped galvanized. Set screws, lock washers, and bolts are stainless steel. Cushions are bakelite, boiled 5 days to prevent distortion. Because the load is carried by the cushions, the metal jaws don't wear. Coupling handles 2.6 to 1,365 horsepower at 100 rpm. Lovejoy Flexible Coupling Co.

E-50—Vertical tank heater, Type KV-244, is portable, weighs only 165 pounds. Three steel channels support the aluminum-fined pipe. Steel legs hold the heater above sludge level. Unit has a 19½-in. diameter and fits through a 20-in. manhole. Griscom-Russell Co.

E-51—Squeegee pick-up attachment works on Clarke Models 610 and 620 Wet-Dry Vacuum Cleaners. It has a 28-in wide squeegee. A flexible hose carries the liquid to the vacuum tank. Squeegee is raised and lowered by a lever on the handle bar. Clarke Floor Machine Co.

E-52—Valve positioner works on the force-balance principle. Unit can be used as a simple controller or a position-indicator unit. It offers a fast, positive, response control for diaphragm actuators. Positioner can be calibrated in the field. Taylor Instrument Co.

E-53 — Warp-tension instrument, called Naptester, gives a direct dial reading in kilograms. Unit uses a 2-in. pressure roll to eliminate individual yarn variation. Tester works inside selvage to avoid any untrue selvage-tension readings. R. Bren D'Amour & Co.

E-54—Trap automatically drains condensate, and vents air from process lines. Uses are low-pressure systems, ventilators, hot-water heaters, and flush tanks. Sizes range from ¾- to 2-in. connection. Maximum pressure rating is 15 psi. V. D. Anderson Co.

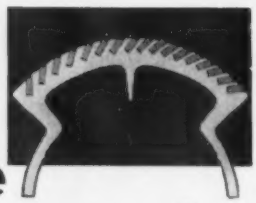
E-55—High-flow air valve comes in sizes up to 8 inches. Unit is suitable for service to 250 psi. It is available in solenoid, remote pilot, or mechanical actuation. Flow capacity goes up to 32,000 cfm. at 100 psi. Valve features low-pressure drop. Hunt Valve Co.

E-56—Drum truck features a special hook for use on fiber and steel drums. A floating-axle design enables one man to handle a 1,000-lb. load. The welded-steel unit is 61 inches high and weighs 71 pounds. Wheels have sealed bearings. American Pulley Co.

E-57—Cloth cutter works on acetate, rayon, nylon, or other thermoplastic fiber. It not only cuts fabrics but it also seals the edge to prevent raveling. Cutting edge is a carboloy-iridium alloy heated to fuse the fiber. Unit uses 115 volts, ac. Sjöström Machine Co.

E-58—Storage rack can be quickly, easily assembled on the warehouse floor. Neither special tools nor equipment is required—pieces are bolted together. Formed upright channels are galvanized—capacity 10,600 pounds at 144-in. height. Paltier Corp.

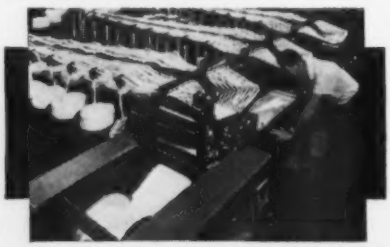
E-59—Binder, for warp size, works on natural, man-made fibers, and blends. This binder, polyfilm B-2, is a water-soluble solution of acrylic resin. It improves the film strength, surface, and size adhesion. Because it is a liquid, it can be added at any point in the size-cooking cycle. Removal from the fabric is easy and complete by normal handling including wetting in enzyme baths. Polymer Industries, Inc.



the Super J Comber's "RUNNING MATES!"

The Even-Draft High Speed Drawing Frame plays an outstanding part in the Whitin system for the unsurpassed processing of either carded or combed sliver. It is equally effective for the pre-combing or post-combing operation.

The Whitin Even-Draft operates at speeds up to 600 ft. per minute on carded stock (or 450 ft. on combed), producing sliver characterized by its evenness and uniformity.



The Whitin Super Lap machine offers a completely new concept in the preparation of Comber laps, effectively superseding all earlier lap forming techniques.

This most unusual new machine processes laps of superior quality from either 48 or 60 ends of drawn sliver, with weights of up to 1200 grs./yd.

Its production capacity is approximately 500 lbs. per hour, turning out laps weighing 35 lbs.

WHITIN

CIRCLE 254 ON READER SERVICE CARD

NOW!

get up to 20% more production

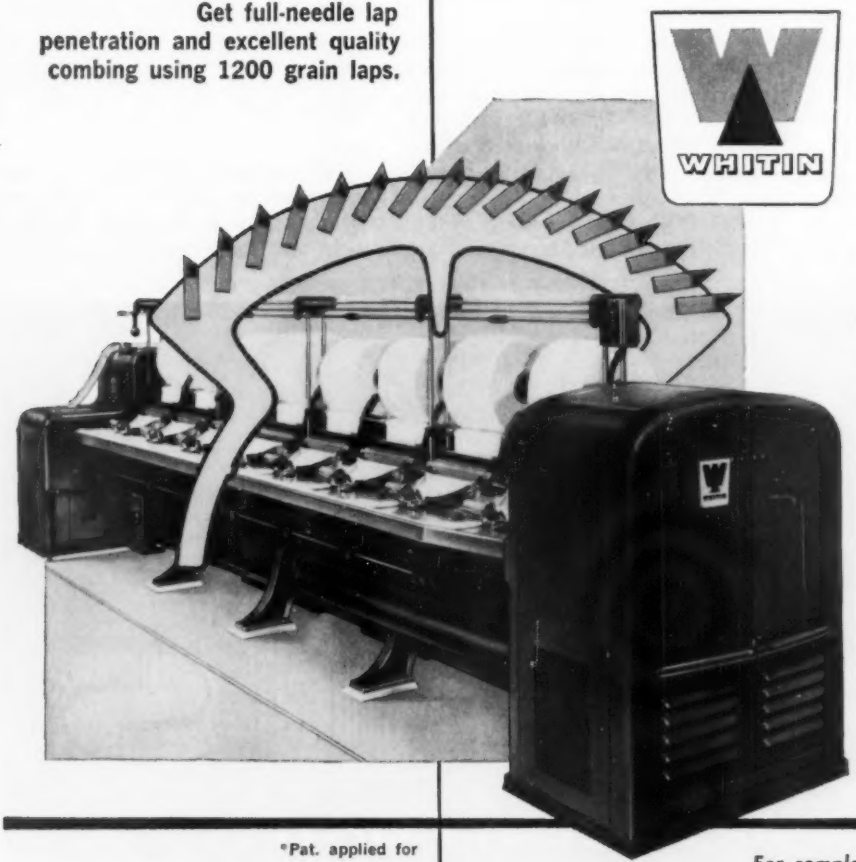
with the WHITIN Super J Comber

and the brand new "GOLDEN CIRCLE"* HALF LAPS

Get full-needle lap penetration and excellent quality combing using 1200 grain laps.

The Whitin Super "J" Comber has already earned an international reputation for its high production and trouble-free performance — but now, with the brand new Golden Circle Half Lap, its production potential is greater than ever.

The Golden Circle Half Lap is the patented product of Whitin research — an extensive research effort "zeroed in" on one objective only, to design and produce a half lap to excel all others in the "quality" combing of heavy grain laps. On Model J5 and J6 Combers, the Golden Circle Half Lap offers you:



SPECIAL FEATURES . . .

- Full-needle lap penetration.
- Lap processing up to 1200 grains.
- Anodized aluminum construction — lighter and stronger.
- Needle strips bonded in slots for greater rigidity.
- Progressive row needle spacing reduces plucking.
- Runs cleaner — stays cleaner.
- Consistent and better nep removal.
- Contoured for better air flow in piecing zone.
- Reduced brush wear.

*Pat. applied for

For complete information ask your Whitin representative or write direct to us.

WHITIN MACHINE WORKS

WHITINSVILLE • MASSACHUSETTS

CHARLOTTE, N. C. • GREENSBORO, N. C. • ATLANTA, GA. • SPARTANBURG, S. C. • DEXTER, ME.

The best way to better yarns

TEXTILE WORLD . . . New Literature

For more information on any of these items, circle appropriate number on the Reader-Service Card, next to the back cover.

TEXTILE MACHINERY & AUXILIARY EQUIPMENT

L-1—Sapphire. Its uses in the textile industry are the subject of this 4-p. bulletin. Text includes data on its properties, applications, and advantages. Three-hole punched. Union Carbide Corp.

L-2—Packaging equipment. This 6-p., 2-color folder features photos of each machine in action. Text and data include electrical requirements and dimensions. Bedford-National Co.

L-3—Bow expanders. Their application to shrinking equipment is described in this 2-p. data sheet. Detailed diagrams show installation. Text discusses advantages. Mt. Hope Machinery Co.

L-4—Drive tensioners. Catalog TR-1 provides dimensional data, selection tables, and price information on three types. Four pages punched for loose-leaf binder. Maurey Mfg. Corp., Service Div.

L-5—Speed control. Discussed in this 8-p. brochure are twelve typical systems illustrated in 3-dimensional schematic drawings. Text lists advantages of control. U. S. Electrical Motors Inc.

L-6—Sewing machines. Operating features of these machines, for closing all types of hosiery, are described in companion bulletins. Cost-saving advantages are listed. The Merrow Machine Co.

L-7—Chain drive. Selection procedures are detailed in 12-p. bulletin. Tables list data on chain sizes and lengths, sprocket sizes, and center distances. Stock-drive equipment is listed. Chain Belt Co.

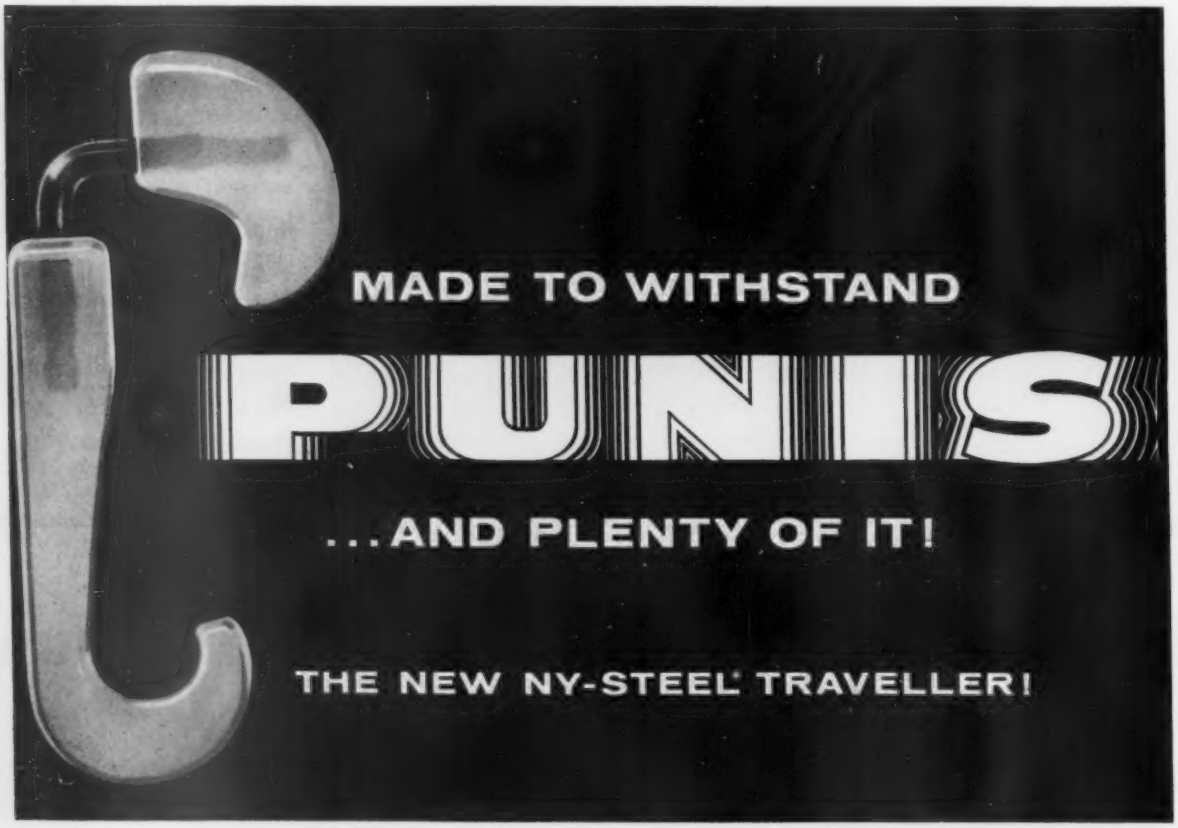
L-8—Transmission belting. More than 50 illustrations demonstrate applications in many mill processes. Time and cost savings are also pictured in this 12-p. brochure. Extremultus, Inc.

CHEMICALS & SUPPLIES

L-9—Sulfonates. A short description including specifications and physical properties accompanies each chemical. Three-hole punched data sheet covers test methods. Chas. Pfizer & Co., Inc.

L-10—Organic chemicals. Featured in this 4-color bulletin are detailed charts that give a wide range of information including applications to adhesives, paints, and textiles. Air Reduction Co., Inc.

L-11—Lithium chemicals. In this technical-data bulletin, properties of present and suggested applications are listed. Selection chart pro-



vides a handy reference guide. Foote Mineral Co.

L-12—Plasticizers. Nine pages of data include specifications and physical properties for four compounds. Test methods and their performance in vinyl films are described. Chas Pfizer & Co., Inc.

ENGINEERING

L-13—Adjustable pressure switches. Photos and drawings of switches with a description of their construction, operation, optional variations, and accessories are in this 2-p. bulletin. Pall Corp.

L-14—Couplings. Product and installation photos and engineering drawings supplement descriptions. This bulletin lists horsepower ratings, dimensions, and prices. Dodge Mfg. Corp.

L-15—Air compressors. Automotive, industrial, and contractor applications are described in 16-p. catalog. Text lists data on more than 200 models with illustrations. Lincoln Engineering Co.

L-16—Pumps. Text covers design, operation, selection, and advantages. Photos and charts illustrate text in this 4-p., 2-color bulletin. Includes complete specification table. Fostoria Corp.

L-17—Package boiler. Fold-out pages reveal all details at a glance. Cutaway views show design and construction of boiler for oil and gas firing. Pictorial applications included. Erie City Iron Works.

L-18—Chemical pumps. Coverage chart, photos, and descriptions of the three models are shown. This booklet in 3-colors also contains a section on dimensions. Ingersoll-Rand Co.

L-19—Flow meters. Twenty pages of illustrations and text include selection and ordering data and accessories. Numerous charts show capacities and dimensions. Wallace & Tiernan Inc.

L-20—Air cylinders. Photos and a cutaway drawing illustrate each of five models. Text gives general description. This 2-color bulletin includes a mounting and valve combination table. Lehigh Inc.

L-21 — Lubrication equipment. Many photos and diagrams amplify the text which describes methods of operation and installation accessories. Catalog 82 is three-hole punched. Lincoln Engineering Co.

INSTRUMENTS & TESTERS

L-22—Tachometer. Bulletin describes design and operation, application, maintenance and calibration, and features. Specifications on three standard models included. Simonds Worden White Co.

L-23 — Temperature regulators. Advantages, dimensions, operation, and specifications are described in 8-p. catalog. Cutaway pictures, flow curve, and sizing charts are included. OPW-Jordan Corp.

L-24—Stroboscope. In 4 pages this bulletin contains features, accuracy, uses, and specifications. Photos show machine speeds being

Coats & Clark's exclusive NY-STEEL (insert) Travellers are made to withstand lots of punishment—even under the most severe twisting room conditions.

A unique combination of nylon and metal, NY-STEEL Travellers are designed especially for use with highly abrasive woolens, worsteds and low-twist synthetics. Only the nylon portion touches the ring; only the metal touches the yarn. Result?—less lubrication . . . less yarn staining . . . far less down time . . . faster speeds . . . *a more efficient, more profitable production operation*. And, Coats & Clark will continue to expand the NY-STEEL Traveller line.

Mail the attached coupon today for free samples, plus Coats & Clark's new 1961 catalog which illustrates and describes the complete Traveller line. There's no obligation. **Trademark.*

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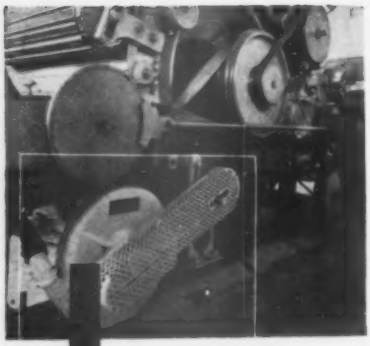
COATS & CLARK INC.
TRAVELLER DIVISION

COATS & CLARK INC.
Traveller Division, Dept. TW81,
1292 McCarter Highway, Newark, N.J.

☐ Send free 14-page illustrated catalog.
☐ Send samples of NY-STEEL Travellers
☐ I'd like your sales engineer to show me how NY-STEEL Travellers will save time and money

*Name*_____
*Firm*_____
*Address*_____
*City*_____ *Zone*____ *State*_____



ACS (Automatic Card Stripper)

1. Less Raw cotton needed·····
2. Excellent even sliver obtained·····
3. Operating hours increased···

Multiply your profits---
How ?---
with our **SPINDLE, RING, ROLLER, PNEUMANIEZ, BLO-CLEANER, ACS, SPI-RA-CLEAN**

NIHON RING

Why ?– Because–
–no breaking-in period needed
–super high speed
–less end down
–amazing longevity of traveller

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NEW LITERATURE

. . . *Begins on page 140*

For more information on any of these items, circle appropriate number on the Reader Service Card, next to the back cover.

checked for correct speeds. Herman H. Sticht Co., Inc.

L-25—Indicators. Illustrated 4-p. booklet includes operating principles, control features, applications, maintenance, and installation. Lists specifications. Thermo Electric Co., Inc.

L-26—Dial timer. Photos illustrate benefits and installation in 8-p. bulletin N-305B. Detailed diagrams point out the basic circuit arrangements. Automatic Timing & Controls, Inc.

L-27—Pressure and vacuum gages. Comprehensive 32-p. catalog details data on instrument types and control systems. Charts and photos supplement text. Minneapolis-Honeywell Regulator Co.

L-28—Pneumatic receiver. Photos demonstrate features and controls. A full-scale reproduction of recording chart is contained in this 6-p. three-hole punched bulletin. The Bristol Co.

L-29—Load-cell system. Data in this 12-p. manual provides for in-plant engineering of projects. Drawings illustrate applications. Charts cover dimensions and price list. W. C. Dillon & Co., Inc.

MATERIAL HANDLING

L-30—Lift trucks. Easy-to-read table lists specifications for 13 standard models. Eleven pages of photos point out industrial applications and features. Automatic Transportation Co.

L-31—Floor trucks. In 2-color Catalog 58A, photos, construction data, and specifications of 130 different models are included. How-to-order data is also covered. Nutting Truck & Caster Co.

L-32—Casters. Complete specifications with load ratings for various types of wheels are offered in 2-p. catalog sheet. Text lists construction features and advantages. The Fairbanks Co.

L-33—Lift trucks. Lease and rental finance plans are described in 12-p. booklet. Methods of obtaining more than 200 models are explained. Supplement lists rates. Automatic Transportation Co.

L-34—Dry-bulk carrier. This 2-color bulletin discusses material flow, discharge control, and equalization of air pressure. Separate table lists key dimensions for four size units. Fuller Co.

L-35—Material management. Bulletin 2800 in 16 pages offers cost-control ideas to manufacturers and wholesalers. Warehousing problems and solutions are discussed. The Rapids-Standard Co., Inc.

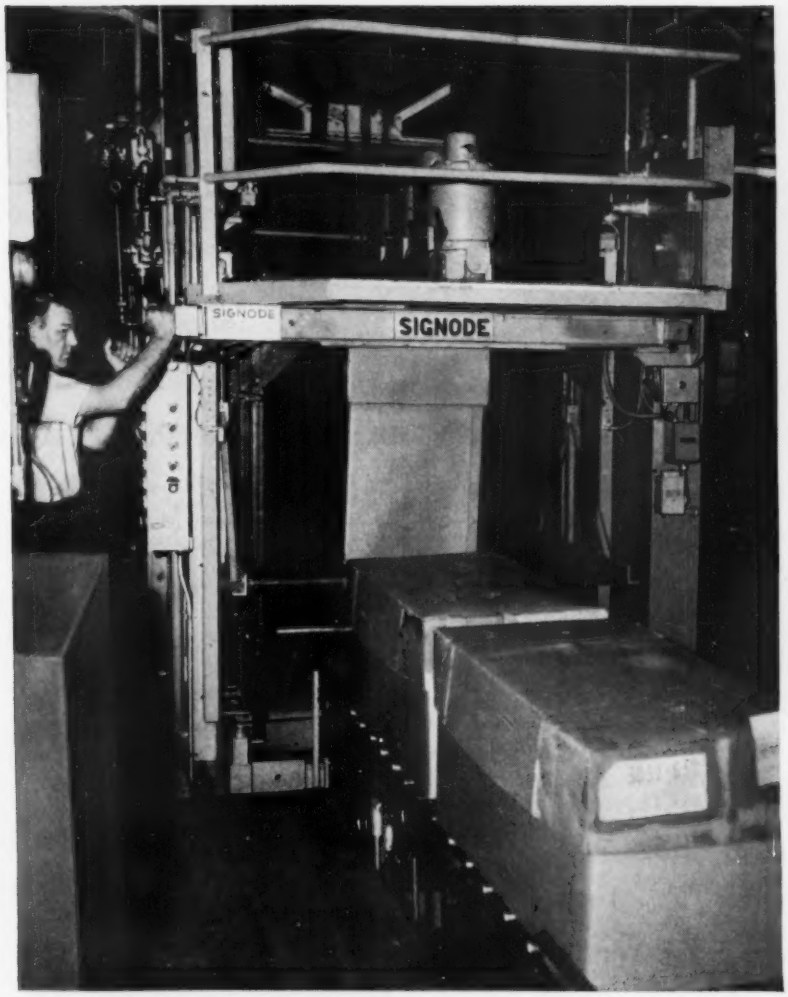
GENERAL

L-36—Shutdown maintenance program. Bulletin folds out to reveal a preplanner chart that's easily read with a glance. Photos and text indicate machine maintenance. Westinghouse Electric Corp.

L-37—Checkweighers. Accuracy, speed, and weight of each model are discussed. Installation photos illustrate industrial applications. Accessories are pictured and described. Toledo Scale Corp.

L-38—Liquid lock washer. Case histories illustrate principal features. Methods of application to the various fasteners are discussed. Specification tables are included. American Sealants Co.

L-39—Dacron. Dyeing and finishing processes with cellulosic fibers are explained in detail. Booklet includes a time-temperature chart for typical dyeing procedures. E. I. du Pont de Nemours & Co.



One man weighs, marks and straps a volume flow of textile cartons

with a Signode Texomatic CSM

With a Signode Texomatic compression strapping machine, this operator weighs, marks and straps a mixed flow of cartons as they move from the textile production line. At the push of a button, the Texomatic CSM automatically lifts to compress the load, then feeds, tensions, seals and severs one, two, or three straps simultaneously in about 12 seconds. This gives the operator sufficient time to weigh and mark the cartons without interrupting their flow, and permits maximum savings in time, effort, and attention.

The new Texomatic is powered by three superbly-engineered M-20 heads with the known ability to operate continuously without attention through a million cycles or more. The M-20 strapping units are simply designed, easily accessible, and powerful enough to prevent overloading at fast speeds and high tensions. The sturdy, rugged, rack and pinion gear assembly gives positive action in raising and lowering; construction of the Texomatic is greatly simplified through the "lift to compress" action.

Let an experienced Signode man help you select the Texomatic compression strapping machine that meets your particular requirements. Write:

SIGNODE

First in steel strapping

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2642 N. Western Avenue • Chicago 47, Illinois
Offices Coast to Coast, Foreign Subsidiaries and Distributors World-Wide
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CIRCLE 143 ON READER SERVICE CARD 143

TEXTILE WORLD . . . Calendar

August

International Congress of Pure and Applied Chemistry, Montreal, Canada, Aug. 6 to 12

September

Combed Yarn Spinners Association, annual meeting, The Greenbrier, White Sulphur Springs, W. Va., Sept. 7 & 8

Northern Textile Association, annual meeting, Poland Spring House, Poland Spring, Me., September 14 & 15

AATCC, Palmetto Section, Clemson House, Clemson, S. C., Sept. 15 & 16

The Elastic Fabric Manufacturers Institute, Inc., The American Power Net Association, New York, Sept. 19

Carded Yarn Association, annual convention, The Cloister, Sea Island, Ga., Sept. 21 & 22

Southern Textile Methods and Standards Association, semi-annual meeting, Clemson House, Clemson, S. C., Sept. 21 & 22

AATCC, Piedmont Section, Hotel Charlotte, Charlotte, N. C., Sept. 23

AATCC, national convention, Hotel Statler, Buffalo, N. Y., Sept. 27 to 29

October

North Carolina Textile Manufacturers Association, Inc., annual meeting, Carolina Hotel, Pinehurst, N. C., Oct. 5 & 6

Alabama Textile Operating Executives, fall meeting, Thach Auditorium, Auburn, Ala., Oct. 7

International Federation of Knitting Specialists, annual conference, Belle Vue, Manchester, England, October 9 to 11

Georgia Textile Operating Executives, fall meeting, Hightower Building, Georgia Institute of Technology, Atlanta, Oct. 14

November

National Cotton Council of America, Chemical Finishing Conference, Washington, D. C., Nov. 8 & 9

Thread Institute, annual meeting, Hotel Commodore, New York, Nov. 9

Narrow Fabrics Institute, Inc., fall meeting, Statler Hilton, New York, Nov. 13 & 14

WRINKLE-FREE

CONTINUOUS-ROLL OPERATION

KAY ANTI-WRINKLE SLAT EXPANDER

By guarding your processing line against wrinkling, the Kay Slat Expander:

1. Allows faster, more efficient machine operation
2. Reduces losses through rejection
3. Assures tighter, neater rolls
4. Assures higher-quality printing and closer register

Supplied with wooden slats for use at room temp. and aluminum for use in ovens, to 550°.

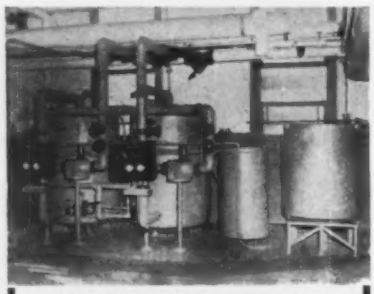
Write for a data sheet

KAY MACHINE COMPANY INC.

Expanders and Rollers

130 Paterson Ave., E. Rutherford, N. J., WEbster 3-4641
EXPORT OFFICE: 401 Broadway, New York 13, N. Y.

CIRCLE 255 ON READER SERVICE CARD



INVERSAND WATER SOFTENER PLANT

producing

CLEAR IRON-FREE 100% SOFT WATER

Often For As Little As 1¢ per 1000 Gallons

Troubled with harshness, poor finish, uneven shades, redyes, seconds, and other product difficulties—?? The secret of uniformity may lie in your water supply. May we check it for you?

HUNGERFORD & TERRY, INC.
Clayton 9 New Jersey

CIRCLE 144 ON READER SERVICE CARD

TEXTILE WORLD . . . Advertisers' Literature

To get items you want offered in the advertisements in this issue, just circle numbers on Reader Service Card next to the back cover. If all bulletins listed under one number are not required, please write on card the name of bulletin desired.

A-350—Pneumatic roll picker. Descriptive literature is yours on request. M-B Products.

A-351—Travelling cleaners. Write for the following illustrated bulletins: Catalog 33A-Floor Sweeper, Catalog 35A-Roving Frames, Catalogs 21A, 34A-Overhead Cleaner, Catalog 37A-Looms and Weave Rooms, Catalogs 32A, 33A-Winders, and Catalog 32A-Twisting and Spinning Frames. The Bahnson Co.

A-352—Factoring. For more information write for "Profit Through Factoring." Walter E. Heller & Co.

A-353—Double-knit machine. Free booklet on this important advance in the interlock field is yours on request. Supreme Knitting Machine Corp. Inc.

A-354—Rotary pressure joints. Catalog S-3002 gives complete details. Johnson Corp.

A-355—Filters. For more information request Bulletin No. 150. Air-Maze Div.

A-356—Power transmission. Write for Bulletin 21103 showing charts permitting proper drive design. T. B. Wood's Sons Co.

A-357—Salt. Request information on Chemical Grade "999" Salt and Purex Salt. Morton Salt Co.

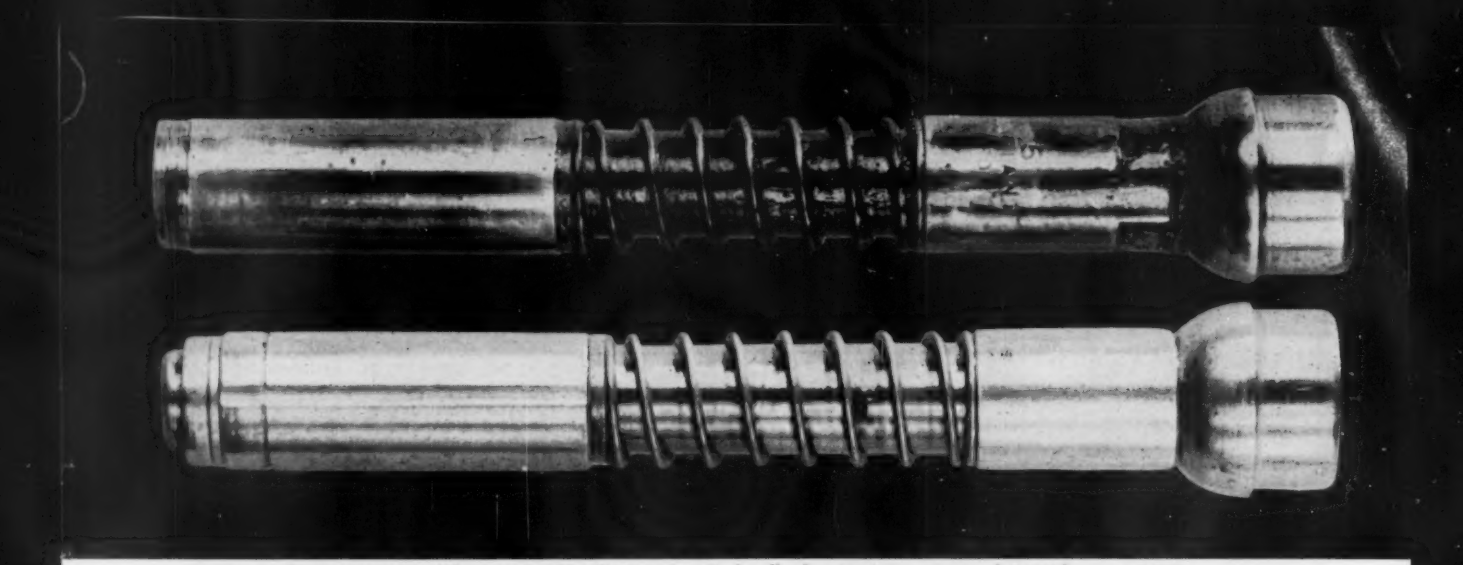
A-358—Antiwrinkle Slat Expander. Data sheet is available on request. Kay Machine Co., Inc.

A-359—FC Drafting system. For more information write for Technical Bulletin FC-101. Roberts Co.

A-360—Travellers. Send for 14-p. illustrated catalog and samples of NY-Steel Travellers. Coats & Clark Inc.

A-361—Textile chemicals. For complete details write for Data Bulletin C-4. W. F. Fancourt Co.

A-362—Dyeing, drying and finishing machinery. In writing for literature mention the machines which interest you. Turbo Machine Co.



You can see the difference that Vexilla D makes. Both roller bearing inserts operated 5,000 hours at 9,000 rpm. *Top*: Bearing lubricated by competitive oil. Note heavy lacquer deposits. *Bottom*: Bearing lubricated by Vexilla D.

BULLETIN:

Shell develops a spindle oil that scours out of fibers, cuts misting loss, helps save yarn and money

Leading mills compared Shell's new Vexilla® Oil D with competitive spindle oils. In a typical test, Vexilla D and another oil were run on identical frames for 5,000 hours at 9,000 rpm.

With Vexilla D there was no corrosion, no deposits to cause spindle wobble or excessive ends down.

Shell's new oil is designed to protect yarn. It scours out of practically all fibers—synthetics included. Read how this new sludge-fighting Shell oil may save money on your frames.

New Shell Vexilla Oil D was developed to solve two major spinning problems:

1. To keep contaminants from sticking to spindle blades or settling in bolster cases—a common cause of spindle wobble.

2. To prevent excessive power consumption due to increased oil viscosity.

Cleaner spindle parts

New Shell Vexilla D is a *dispersant* oil. This simply means that Vexilla D keeps little bits of sludge (oxidized oil) and lacquer from "growing" and adhering to sensitive spindle parts.

In six months or less you start seeing the results of Vexilla D's dispersancy. Spindle blades are bright and clean—free from sludge and lacquer deposits.

There is less spindle wobble, less spindle drag. Fewer ends down. Less maintenance.

Resists foaming, misting

Vexilla D is specially formulated by Shell to resist foaming. It contains powerful additives to help prevent foaming and misting—even at maximum speeds. Oil stays in the bolster where it belongs.

But Shell didn't stop there. A special cleansing agent was also added to Vexilla D.

No longer need good yarn be ruined by oil thrown up by spindles. Vexilla D does not stain yarn. It scours out. Mill experience proves it.

Check your Shell Industrial Products representative for complete facts on new Vexilla Oil D. Or write: Shell Oil Company, 50 West 50th Street, New York 20, N. Y.

SHELL ®

A BULLETIN FROM SHELL
—where 1,997 scientists are working to provide better products for industry

NEW! AUTOMATIC SELF CLEANING

LINT-A-MAZE ARRESTOR

Cleans the air of...

* **LINT**
* **CHAFF**
* **FIBROUS MATERIAL**

AIR-MAZE LINT-A-MAZE FILTERS are specially designed to provide 98% or more efficiency in removing heavy concentrations of lint, chaff, leather cuttings and similar materials from the air. Brushes mounted on a chain carrier continually sweep and automatically clean the collector screens. Collected material is deposited in a hopper for reprocessing or sale. Lint-A-Maze filters offer these important advantages:

- Low initial cost . . . low operating cost
- Require less than 50% of the space normally needed
- Virtually eliminate maintenance – no rolls or blankets to replace, no washing or cleaning
- Handle wet or dry impurities
- Can be installed in any recirculating air opening, ventilating or air-conditioning system
- Available for airflow requirements from 7,000 to 150,000 CFM, can handle air velocities from 250 to 1900 FPM.

FREE! For additional information write for Bulletin No. 150.

AIR-MAZE DIVISION
CLEVELAND 28, OHIO
ROCKWELL-STANDARD CORPORATION

TEXTILE WORLD . . .

News About Suppliers

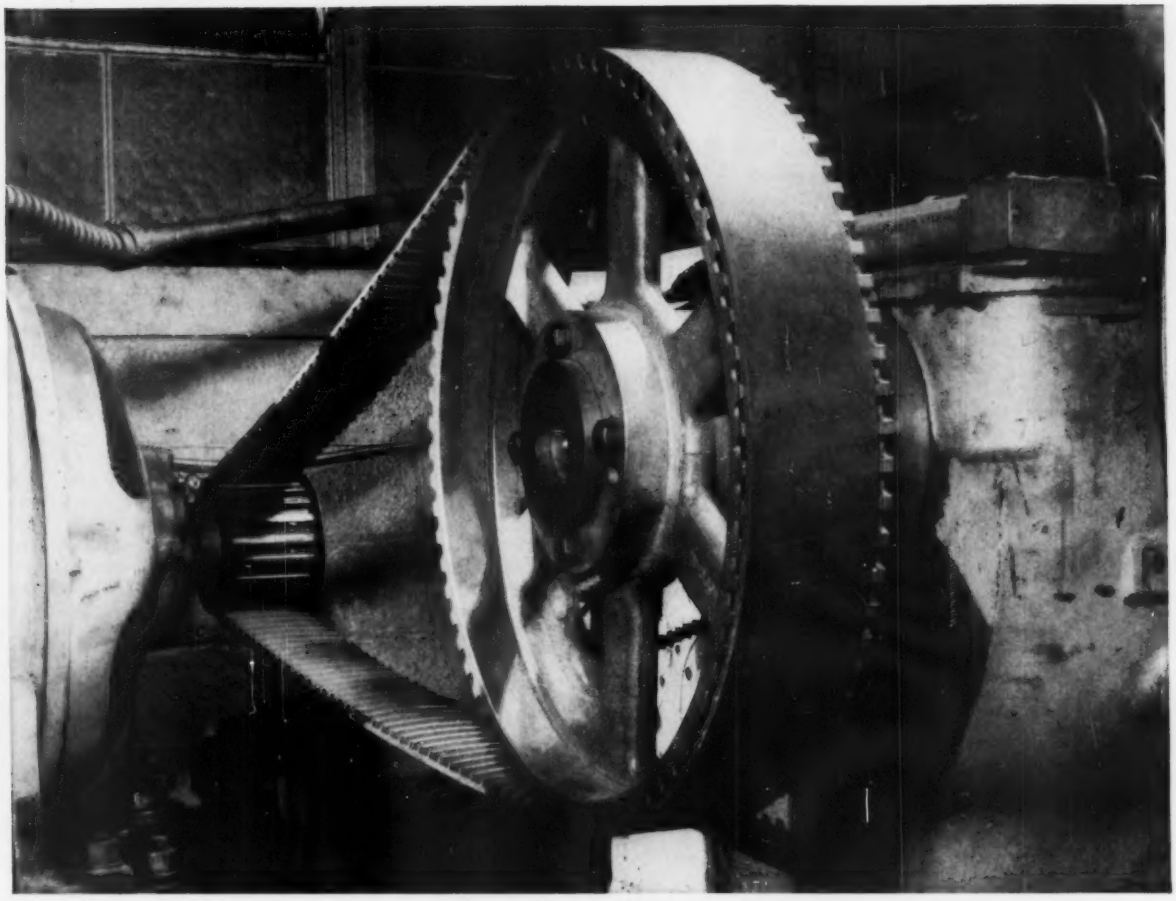
AMERICAN VISCOSE CORP., Philadelphia, will build a commercial plant to produce Avicel, the company's new microcrystalline-cellulose food ingredient. T. H. Andrews, who has been assigned additional areas of market coverage, will now supervise contacts in the nonwoven and filtration trades. . . . **H. W. BUTTERWORTH & SONS CO.,** Bethayres, Pa., has named Stanley Brooks executive vice president. During 1961-62 the firm will invest about $200,000 in research and development of new processes and equipment for the textile-finishing and plastics industry. . . . **CHEMSTRAND RESEARCH CENTER, INC.,** Durham, N. C., has promoted Dr. Arnold L. McPeters to group leader of the spinning group in the new products section.

JOHN A. VOLLMANN (left) has been elected president of Robert Reiner, Inc., Weehawken, N. J. PAUL C. LOGUE (center) has been appointed manager of textile sales, Wica Chemicals, Inc., Charlotte, N. C. VERNON B. JENSEN (right) has been named district manager in Cleveland, Toledo, and Detroit areas of Cleveland Tramrail and Steelweld Machinery Divisions, Cleveland Crane & Engineering Co., Wickliffe, Ohio.

CLINTON CORN PROCESSING CO., Clinton, Iowa, has appointed Everett E. Hanke district sales manager for the New England states with headquarters in Somerville, Mass. . . . **COLLOIDS, INC.,** Newark, N. J., has announced that Charles K. Schramm has joined the company as manager of technical services. . . . **CORN PRODUCTS SALES CO.,** New York, has named Britton E. Balzerit manager, market development, for the Industrial Div. . . . **COURTAULDS NORTH AMERICA INC.,** New York, has acquired over 100,000 shares of common stock in Koppers Co., Inc., Pittsburgh. . . . **CREST CHEMICAL CORP.,** Newark, N. J., has appointed Charles A. Tier chief chemist of its textile and industrial laboratory.

EASTERN AIR LINES, INC., New York, has appointed Fred A. Collin manager of cargo sales. . . . **FOOD MACHINERY & CHEMICAL CORP.,** New York, will build a multimillion dollar hydrogen-peroxide plant in West Virginia. . . . **FOXBORO CO.,** Foxboro, Mass., has opened a $700,000 assembly plant in East Bridgewater, Mass. The new 40,000-sq.-ft. plant produces all of its solid-state electronic line. . . . **GENERAL ANILINE & FILM CORP.,** New York, has appointed Gene A. Brost product manager, intermediates, Antara Chemicals. . . . **GENERAL ELECTRIC CO.,** Schenectady, N. Y., has named Randolph L. Houlton manager, process automation engineering, of the Industry Control Dept.

GENERAL TIRE & RUBBER CO., Toledo, Ohio, has installed its $2-million giant high-speed vinyl calendar at the Textileather Div. The division is also constructing a $400,000 office building in Toledo. . . . **HERCULES POWDER CO.,** Wilmington, Del., has appointed Dr. Richard S. George director of sales, organic chemicals, for the Synthetics Dept. Dr. W. Donald Thompson was named manager of research and development, Fiber Development Dept. . . . **JAMES HUNTER, INC.,** Mauldin, S. C., has announced that Hans J. Klaeui has joined its development engineering staff. . . . **INDUSTRIAL RAYON CO.,** Cleveland, has appointed John W. Brownley vice president of marketing. . . . **KOPPERS CO., INC.,** Pitts-



Here's how WOOD'S helps you with

PROBLEM-SOLVING, POSITIVE ACTION

Five, easily understood charts, developed by Wood's, permit proper drive design with almost no calculations. WRITE FOR BULLETIN 21103.

Wood's has the drive, the positive action Timing Belt Drive . . . PLUS THE EXPERIENCE it takes to give positive, workable solutions to your power transmission problems. Wood's Timing Belt Drives provide instantaneous, slip-free response . . . *full* power transmission. They require no lubrication, no motor bases, no tensioning devices. Belt matching is eliminated. And, their speed range is exceptional . . . from 0 to 16,000 fpm. Load capacities range up to 600 hp and above. Belts are unusually strong, but they are thin and flex readily, eliminating heat build-up, maintaining high operating efficiency. When you want positive action, investigate Wood's Timing Belt Drives. You'll find outstanding solutions to a wide variety of drive problems.

Wood's

T. B. WOOD'S SONS COMPANY

CHAMBERSBURG, PENNSYLVANIA

ATLANTA • CAMBRIDGE • CHICAGO • CLEVELAND • DALLAS

TD/161

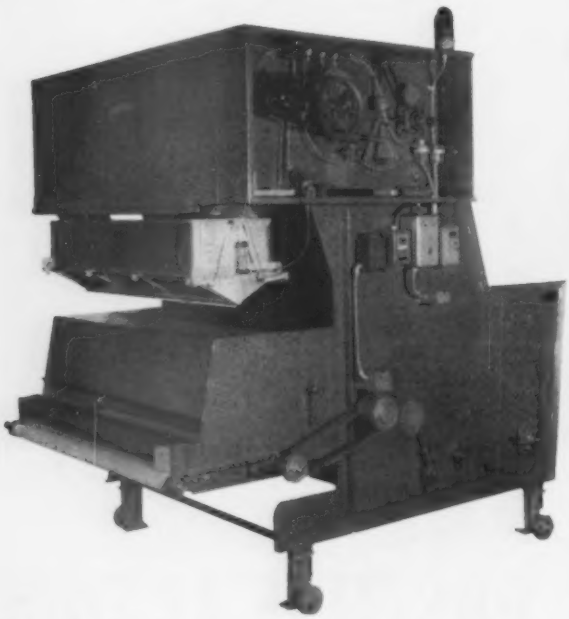
CIRCLE 147 ON READER SERVICE CARD

FIBER CONTROLS

— UNIFEEDER —

CARD-FEED FOR WOOL CARDS, GARNETTS, SYNTHETIC and COTTON PICKERS

An accurate automatic **stock metering unit** that will handle **any staple fiber, natural** or **synthetic.**



This precise unit is available in 48 inch, 60, 72 & 84 inch widths. Dump to dump accuracy is less than 2½% total variation. This metering accuracy indicates the degree of opening accomplished between the comb and the apron pins. Rejected production is negligible. Simplicity of design makes this system extremely economical to operate and maintain.

Using this equipment, the result is a mat of stock, **uniform in weight and density** consistently to the feed rolls.

IT IMPROVES YOUR PRODUCT . . .
FACILITATES CONSTANT QUALITY AND
COST CONTROL . . .
REDUCES WASTE . . .

For more complete details of this equipment call or write:

U. S. Sales Agents:
PARROTT and BALLENTINE, Inc.
3440 Augusta Road, Greenville, S. C.

FIBER CONTROLS CORPORATION
BOX 1358 GASTONIA, NORTH CAROLINA

burgh, has promoted H. M. Gorton Jr., to manager of the Dyestuffs Sales Dept. K. C. Ruppenthal succeeds Mr. Gorton as Eastern sales district manager.

MIDLAND-ROSS CORP., Cleveland, has announced the retirement of Chester J. Schmidt as vice president and general manager of J. O. Ross Engineering Div. . . . **NOPCO CHEMICAL CO., INC.,** Newark, N. J., has acquired six Midwest foam companies from D & W Clark Corp, Chicago, for 30,000 shares of Nopco common stock. The Plastics Div. has opened a new urethane-foam producing and fabricating plant at Chattanooga. Richard B. Anderson has been named a sales representative in S. C., Ga., Ala., Tenn., Miss., and Ark. . . . **PUTNAM CHEMICAL CO.,** Beacon, N. Y., is constructing an office and laboratory building, manufacturing plant, and warehouse at Charlotte, N. C. It's the first step in moving all operations to Charlotte.

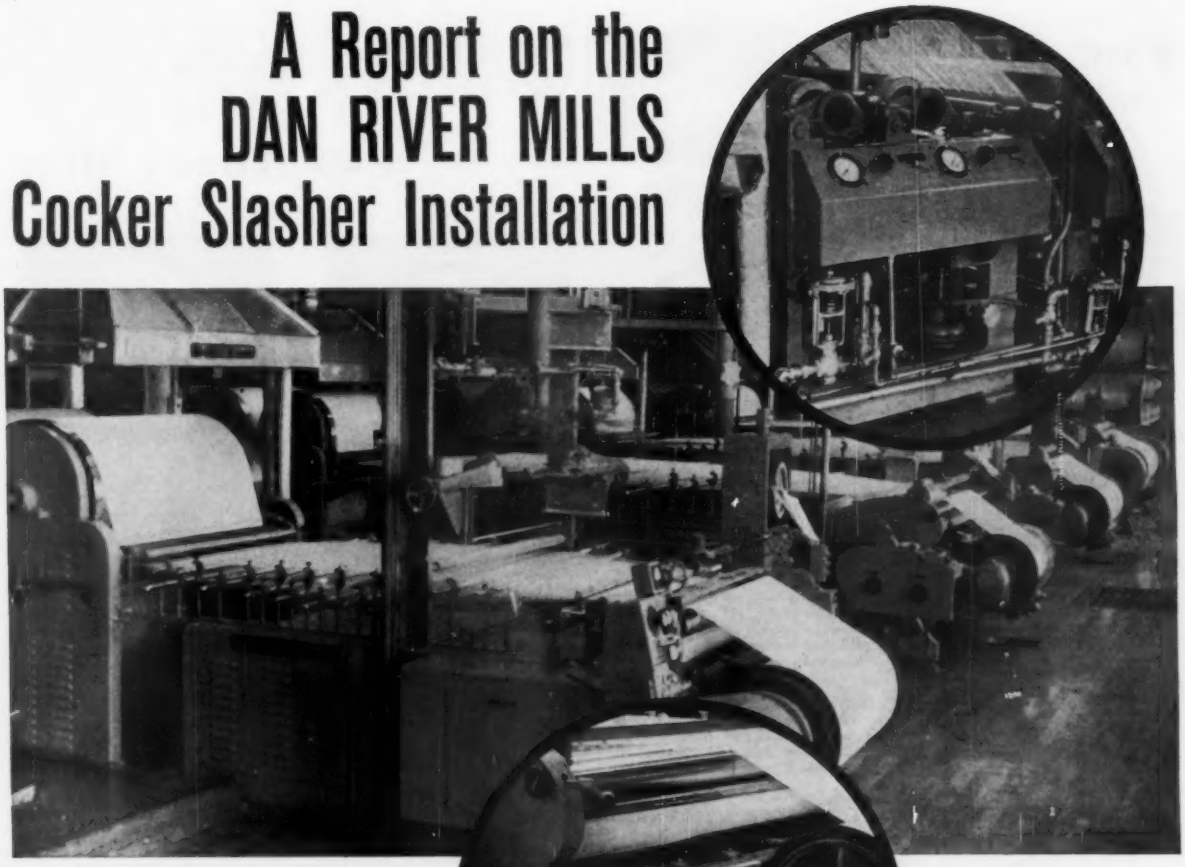
SACO-LOWELL SHOPS, Boston, has appointed M. Ray Harden manager of the Greensboro, N. C., office. . . . **SEYDEL-WOOLLEY & CO.,** Atlanta, has announced that Joseph J. Harand has joined the firm as technical representative in the Finishing Div. . . . **SONOCO PRODUCTS CO.,** Hartsville, S. C., has named C. W. Coker Jr., R. B. White, and P. C. Coggeshall vice presidents. The company also appointed the following: C. H. Campbell Jr., assistant general field sales manager; Robert Blackwell, divisional sales manager; J. A. Gainey, resident sales manager; R. E. Tuck, assistant resident sales manager; and J. B. Boyd director of purchases.

STAR PAPER TUBE, INC., Rock Hill, S. C., has moved into a new plant in Danville, Va. . . . **STEEL HEDDLE MFG. CO.,** Philadelphia, has named Robert W. Westmoreland sales representative in the Greensboro, N. C., office. J. D. Carson Jr. has been appointed sales representative in the Atlanta office. . . . **STOWE-WOODWARD, INC.,** Newton Upper Falls, Mass., has announced that James P. McNamee has joined the Research and Development Dept. as roll-development manager. . . . **TEXTILE MACHINE WORKS,** Reading, Pa., has transferred its J. L. Ferguson Co. operations from Joliet, Ill., to Reading, and renamed it the Packomatic Div. . . . **TORRINGTON CO.,** Torrington, Conn., announced a $6-million expansion program. The project will provide a new bearings-manufacturing plant near Clinton, S. C., and a wire mill adjacent to its Broad Street Plant in Torrington.

TURBO MACHINE CO., Lansdale, Pa., has announced that R. W. Breidenbach has joined the firm as a sales engineer, covering the Southern hosiery mills and finishing plant. . . . **USTER CORP.,** Charlotte, N. C., has named Hans Winiger sales manager of product sales. . . . **WARNER & SWASEY CO.,** Cleveland, has promoted John R. Longenecker to advertising manager, Textile Machinery Div. . . . **WHITIN MACHINE WORKS,** Whitinsville, Mass., has appointed J. Lawrence Orr product manager of cotton machinery. Harry B. Patterson succeeds Mr. Orr as regional sales manager of the Charlotte-Greensboro region with headquarters in Greensboro, N. C. Lucius M. Hair has been named assistant regional sales manager for the same region with headquarters in Charlotte, N. C. William J. Dunleavy has been appointed to the newly created post of manager of field services.

CHEMSTRAND CORP. is expanding its nylon plant at Greenwood, S. C. The plant which has been in operation only since last October will be expanded by 200%.

A Report on the DAN RIVER MILLS Cocker Slasher Installation



In 1959, Dan River Mills integrated their slasher operations as shown in the picture above. These four machines (2 GH and 2 1954 models) have replaced eight other slashers of varying types and ages.

These four Cocker Slashers easily carry a load of 2547 looms, running everything from prints to fancies and stripes—yarn counts 20s to 50s—and from 4700 ends 32/1 to 9540 ends 32/1.

Minimum Loom Beam Width
50 Inches

Maximum Loom Beam Width
107¾ Inches

Maximum Loom Beam Head Diameter
32 Inches

- Large picture shows modern Slasher Room at Dan River Mills, Inc.
- (above) Control panel on double size box gives quick direct readings. Air motors assure precise and even loading of top rolls.
- (left) This view shows the revolutionary Cocker Torque Tube Drive and convenient control panel.

Speeds . . .

Dye Beams up to 150 ypm
Stripes up to 150 ypm
4770 ends 32/1—150 ypm
9540 ends 32/1—79 ypm
Top Operating Speed—150 ypm
Heaviest Production set—79 ypm
Average Production operating on 120 hours per week on shift for shift basis—69,716 lbs. per slasher.

Write for Full Information

COCKER MACHINE & FOUNDRY COMPANY

IN CANADA:
Contact W. S. Clark
Montreal, Canada
Oxford 7-2242

IN MEXICO:
Ing. J. Via, Jr.
I. La Catolica 45-911
Mexico, D. F.

PLANT & OFFICES
at Ranlo, N. C.
MAILING ADDRESS:
Gastonia, N. C.

WORLD'S LARGEST DESIGNERS AND BUILDERS OF COMPLETE WARP PREPARATORY EQUIPMENT

BE SURE YOU SPECIFY—
ON YOUR NEW FRAMES PNEUMAFIL®

Only PNEUMAFIL
gives you exclusive "air flow" suction to "swallow" more air, capture more lint, enable faster front roll speeds. Special ring diffusor fan gives widest range of operation at peak efficiency. Choice of three discharge arrangements.

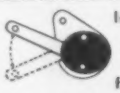
plus

DELTAFLUTE

A powerful new "lap fighter." Unique shape allows closer flute positioning under front roll. Shorter, wider orifice concentrates air stream at point of maximum lint generation for remarkably good cleaning.

plus

DUFLEX SUSPENSION



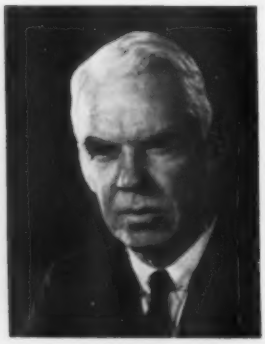
Instant and effortless two-position suspension of flutes permits operator to work around rolls with both hands. Eliminates danger of scratched orifices which cause lint accumulation.

PNEUMAFIL CORPORATION • CHARLOTTE 8, N. C.
CIRCLE 256 ON READER SERVICE CARD

DARY
Dary RING TRAVELERS...
SINCE 1898
THE DARY RING TRAVELER CO.
TAUNTON, MASSACHUSETTS
LINDSEY L. PHILLIPS, Treasurer, Taunton, Mass.
Consult your friendly Dary Representative:
JOHN H. O'NEIL Box 720, Atlanta, Ga.
JAMES H. CARVER Box 23, Rutherfordton, N. C.
CRAWFORD "JACK" RHYNER Box 2261, Greenville, S. C.

TEXTILE WORLD . . .

News About Men



ALLEN E. GANT (left) has been elected chairman of the board and JAMES P. KINARD (right) president and treasurer of Glen Raven Mills, Inc., New York. The newly formed corporation will handle all of the sales of the various Glen Raven Industries.

James H. Blore has been named director of fabric development, Knitting Div., Laurens Mills, Laurens, S. C.

Benjamin J. Bornstein has been appointed director of plant operations for Standish Mills, Inc., Esmond, R. I., and Fairfax Mills, Inc., Pawtucket, R. I.

Earl W. Breyman has been elected a vice president in charge of the Hand Knitting Yarn Div., Caron Spinning Co., Rochelle, Ill.

Lawrence R. Brumby has been elected vice president of research and development, Bibb Mfg. Co., Macon, Ga.

P. H. Chance has retired as general manager of the Automotive Div., Collins & Aikman Corp., New York.

A. J. Combias has been appointed manager of the finished shirtings department of J. P. Stevens & Co., Inc., New York.

Ralph Cornman will retire as director of purchases for Collins & Aikman Corp., New York.

Abraham J. Dankberg has retired as sales representative after forty years with Bradford Dyeing Association (U.S.A.), Bradford, R. I.

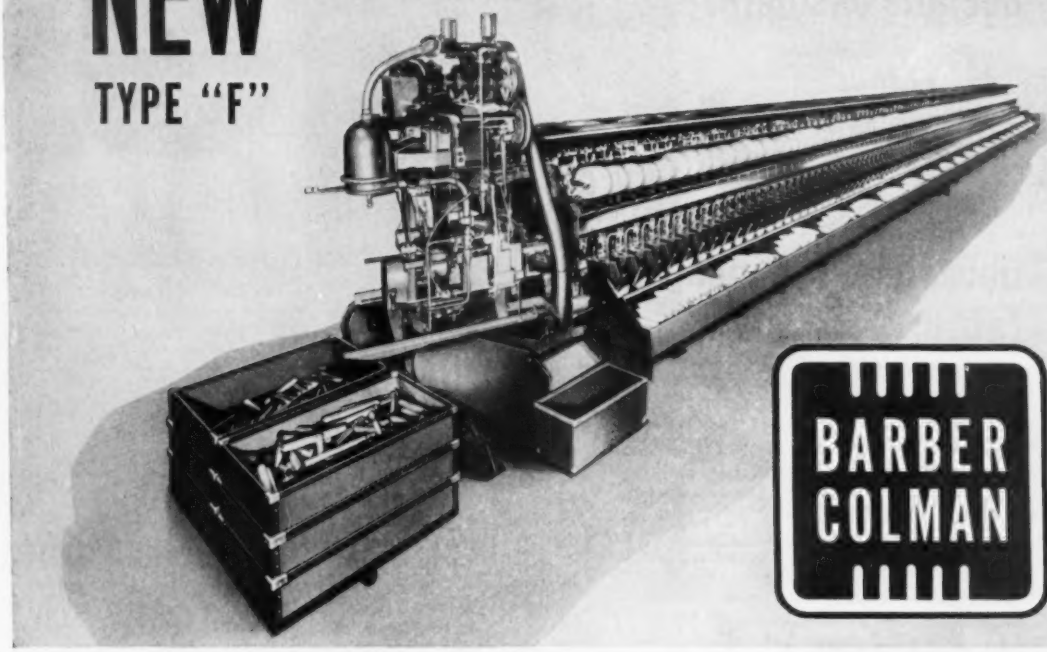
Armand A. Durante Jr. has been named market manager of the general industrial fabrics department of Deering, Milliken & Co., Inc., New York.

Earl R. Grady has been

ANTHONY F. EARLEY (left) has been appointed executive vice president and LAWRENCE R. MALONE (right) vice president of Leslie, Catlin & Co., Inc., a division of Burlington Industries, Inc., New York.

NEW AUTOMATIC SPOOLER

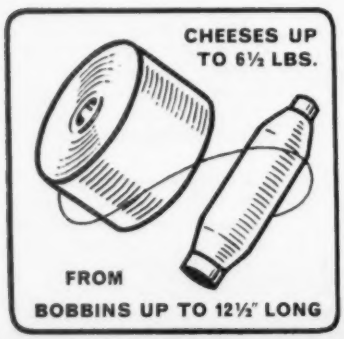
TYPE "F"

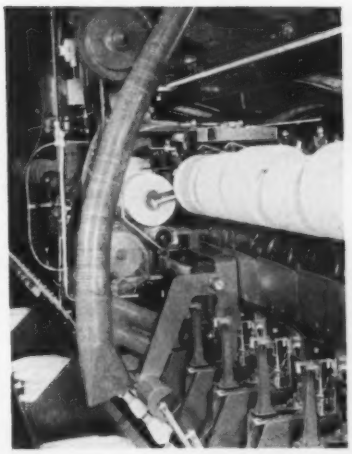


BARBER COLMAN

DESIGNED FOR MODERN SPOOLING FROM LARGE BOBBINS TO LARGE CHEESES

The best features of preceding machines have here been combined with many modern improvements to produce this latest and greatest of Barber-Colman Automatic Spoolers. Increased capacity permits spooling of cheeses up to 6½ lbs. from bobbins up to 12¼" long. Bobbin pockets with movable skewers are lengthened and improved. Permanently-balanced bakelite drums have new crossover double grooves. Quick-set snick plates, one of the finest yarn cleaners ever developed, are easily accessible. Double cheese-supporting arms have built-in brakes. A radical new feature is an automatic sorter that separates empties from tailings bobbins, eliminating any further handling of bobbins after placing them in the pockets. Another valuable innovation is a tape-breaker mechanism, a simple device that greatly improves the build of the cheese. By using the 6½ lb. cheese, production improvements can be achieved in warping, doubling, twisting, backwinding, sale cones, knitting, unifil, shuttleless looms, or quillers. *For full information on how this new Spooler can benefit you, see your Barber-Colman representative.*





Above, a close-up view of traveler moving along the cheese row, picking up the ends from the bobbins and tying them to the cheeses.

"EVERY KNOT A TRUE WEAVER'S KNOT"

AUTOMATIC SPOOLERS • SUPER-SPEED WARPERS • WARP TYING MACHINES • WARP DRAWING MACHINES

BARBER-COLMAN COMPANY

ROCKFORD • ILLINOIS • U. S. A.

FRAMINGHAM, MASS., U. S. A. GREENVILLE, S. C., U.S.A. MANCHESTER, ENGLAND MUNICH, GERMANY

INDIA	MEXICO	BRAZIL	JAPAN	PAKISTAN	PAKISTAN
Batliboi & Company Forbes Street, Fort Bombay, India	J. Rabasa Isabel la Catolica 45-913 Apartado 7348 Mexico D.F. Mexico	Industria e Comercio de Maquinas S. A. Avenida Rio Branco No. 50, Rooms 1201-3 P. O. Box No. 63 Rio de Janeiro, Brazil	Do-Yei Shoji Kabushiki Kaisha Atlas Building (7th Floor) 11, Bingo-machi, 3-chome, Higashi-ku, Osaka, Japan	Associated Agencies (M'cr.) Ltd. Piccadilly House 11 Piccadilly Manchester 1, England	Associated Agencies (M'cr.) Ltd. 27 Kothari Building Napier Road Karachi 2, Pakistan

On August 1, 1961, burlap tubing became obsolete!

Fulton DurLap

new wood cellulose fabric *better than burlap for Roll Goods, All Items!*

Fulton's revolutionary new DurLap tubing is extra strong and durable . . . assures safer shipping . . . allows continuous re-use . . . and provides speed, versatility, and cost-cutting economies in the packing process!

CHECK THESE OUTSTANDING ADVANTAGES Free of lint, odor, oil . . . Water repellent, super strong . . . Resilient knit for neat form-fit . . . Holds stenciling better . . . Custom-dyed colors . . . Competitively priced, Money-back guarantee . . . American made, no delay in delivery.

Telephone 688-1111
TWX: AT 24

Fulton COTTON MILLS
a division of Fulton Industries, Inc.

P.O. Box 1726
Atlanta 1, Georgia

CIRCLE 257 ON READER SERVICE CARD

DOUBLE RUB, FOUR BANK TAPE CONDENSER

Built in 48", 60", 72" widths for adaptation to all carding machines. Write for information.

Duesberg-Bosson of America, Inc.
Main Street Jefferson, Mass. P.O. Box 25

News About Men . . . *Begins on page 150*

JOHN W. CONNELL has been elected to the newly created post of vice president, staff services of Indian Head Mills, Inc., New York.

RICHARD B. WINDHORST has been appointed product supervisor for textile on waterproof products, Bemis Bros. Bag Co., St. Louis.

elected treasurer of Moore Fabrics, Inc., Pawtucket, R. I.

Dr. Guenther R. Gruber has resigned as Austrian trade delegate for the Midwest. He has been appointed to the position of vice president for marketing of Getzner, Mutter & Cie, Bludenz, Austria.

A. Wilkerson Gunn has been named executive vice president and chief executive officer of Abney Mills, Greenwood, S. C.

John M. Holmes has retired as chief engineer at the Westerly, R. I., plant after forty years with Bradford Dyeing Association (U.S.A.), Bradford, R. I.

Vincent Indrieri has been appointed head of converting operations at Bates Fabrics, Inc., New York.

Samuel Katz has been appointed head of the Tricot Dept. of Beaunit Mills, Inc., New York.

Fred W. Langdon has joined Riegal Textile Corp. as product development manager of the Johnston, S. C., Div.

Earle R. Loomer Jr. has been appointed to the newly created position of merchandise manager of the carded cotton division of Deering, Milliken & Co., Inc., New York.

Thomas W. MacLeod has been elected a vice president of Cluett, Peabody & Co., New York, and named a director of its retail operations.

Dean S. Manchester has been named project man with the pilot plant at Hatch Mill, Columbus, N. C., Deering, Milliken & Co., Inc.

Harry C. Mangold has been appointed administrative vice president of Wayne Knitting Mills, Fort Wayne, Ind.

James D. Maver has been named to the new position of senior vice president and branded marketing director of Burlington Hosiery Co., a unit of Burlington Industries, Inc., New York.

Wiley Mayes has been promoted to assistant manager of Glen Raven Cotton Mills, Inc., Glen Raven, N. C.

Alex Mumford has been recently elected vice president of Wunda Weve Carpet Co., Greenville, S. C.

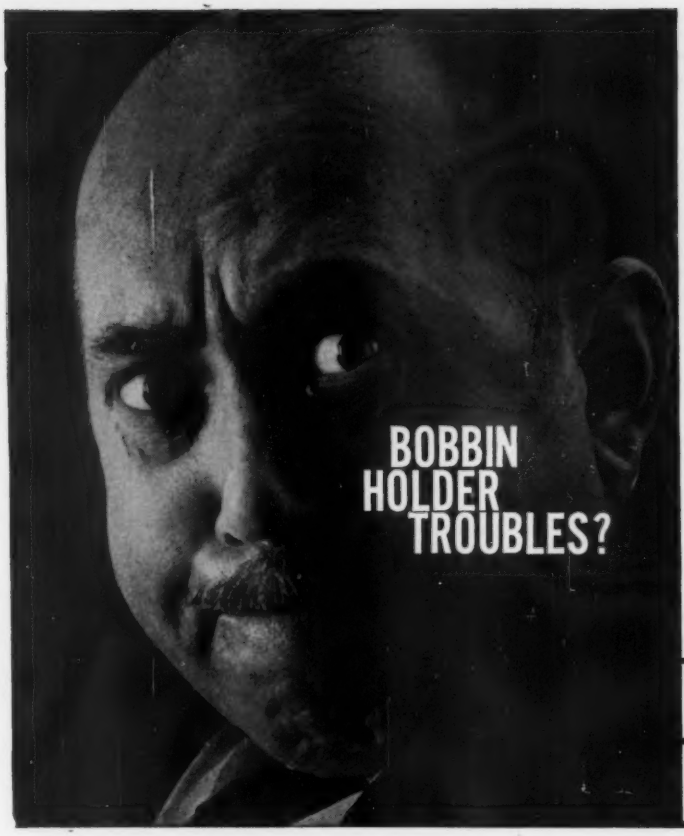
Eugene W. Owen of Canton Cotton Mills has been recently elected chairman of the Personnel Managers Div., Georgia Textile Manufacturers Association, Atlanta.

Robert Pacheco has been named supervisor of the weaving and yarn preparation department of the Rutherfordton, N. C., mill of Excelsior Mills, Inc.

Kent Pate has been named superintendent of Cameo Hosiery Co., a unit of Burlington Industries, Inc., Greensboro, N. C.

W. W. Pate Jr. has been recently promoted to vice president and general manager of Wunda Weve Carpet Co., Greenville, S. C.

. . . *Turn to page 154*



Bobbins falling off the creel? Yarn stretching and breaking because of inferior bearings? Limited to one size bobbin? Labor costs increasing due to excess creeling time?

Bendix offers *quality* bobbin holders that correct all these troubles. Both the Bendix® Spin Master (toggle) and Eclipse (spring) type bobbin holders are now offered with various bolt dimensions and thread sizes *that are interchangeable with your present installation.* Production losses can be kept to a minimum during change-over.

If you need or plan a replacement program, be sure this time to specify Bendix. The final cost is less.

Bendix-Elmira

Eclipse Machine Division—Elmira, New York

THE Bendix CORPORATION

Odell Mill Supply Co., Greensboro, N. C. North Carolina • Virginia	Export Sales: Bendix International 205 E. 42nd St., New York 17, N.Y.
Greenville Textile Supply Co., Greenville, S. C. South Carolina • Georgia Alabama • Tennessee	FURNISHED AS ORIGINAL EQUIPMENT BY LEADING TEXTILE MACHINE MANUFACTURERS

CIRCLE 258 ON READER SFRVICE CARD

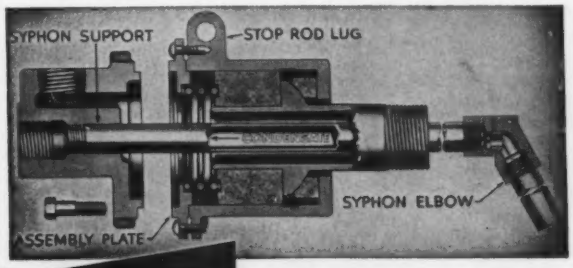
READERS . . .

Do you need more information on a product or service advertised?

USE READER-SERVICE CARD FOR PROMPT REPLY.

TRY THIS on your Dry Cans and 30" Slasher Cylinders

We'll gladly furnish a pair of these units for 90-day obligation-free trial in your mill. The Type SB2P is self-supporting, completely packless, needs no lubrication or adjustment. The Johnson Syphon Elbow permits the use of two straight pipes instead of an unwieldy curved syphon pipe, is hinged to pass right through the joint.



Johnson ROTARY PRESSURE Joints

First in the Textile Industry

Write for Catalog S-3002

Shows self-supporting Johnson Joints for all needs . . . on print cans, calenders, compressive shrinkage ranges, big 5' and 7' cotton slashers, dry cans, etc.

THE JOHNSON CORPORATION

814 Wood St., Three Rivers, Mich.

CIRCLE 153 ON READER SERVICE CARD

Model 31 AD Piece-End Sewing with SAFE Retractable Pins

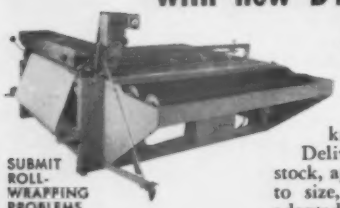
20" dia. cloth wheel with 6 pairs of pins retracted by cam with automatic cloth stripping. Retracted pins are safe. Heavy duty gear type sewing head. Single chain stitch. Wide range of stitch adjustments. Motor Drive.

DINSMORE MANUFACTURING COMPANY
BOX 267 SALEM, MASSACHUSETTS

CIRCLE 259 ON READER SERVICE CARD

WRAP ROLLED GOODS 4 TIMES FASTER

with new DYKEN *Speedwrap*



SUBMIT ROLL-WRAPPING PROBLEMS TO

Automatically packages rolled goods in neat, rigid, non-slip kraft paper wrapping. Delivers paper from roll stock, applies glue, cuts paper to size, and wraps. Can be adapted to your needs.

DYKEN MFG. CO. 123 JACKSON STREET OSHKOSH, WISCONSIN

CIRCLE 260 ON READER SERVICE CARD

CHAS. T. MAIN, INC.
Engineers

TEXTILE MILLS AND OTHER INDUSTRIAL PLANTS

BOSTON, MASSACHUSETTS
CHARLOTTE, NORTH CAROLINA

ELECTRICAL, STEAM, DIESEL AND HYDRAULIC ENGINEERING
MACHINERY REORGANIZATION
WATER SUPPLY
INVESTIGATIONS
REPORTS AND APPRAISALS
CONSTRUCTION SUPERVISION

News About Men

. . . *Begins on page* 150

Jack R. Pruitt has been appointed superintendent of Limestone Mill No. 2, Limestone Mfg. Co., Gaffney, S. C.

Raymond Purdy has recently joined Amerotron Co., a division of Textron Inc., New York, as technical services coordinator.

Arthur N. Richman, president of Art-Rich Mfg. Co., has been elected president of the Tufted Textile Manufacturers Association.

William F. Robertson, vice president of Riegel Textile Corp., has been re-elected president of the South Carolina Textile Manufacturers Association, Columbia, S. C.

Jack Robin has been promoted to executive vice president of Crown Chenille Mfg. Co., Chatsworth, Ga.

Carl H. Rowe has been named manager of the new plant of Kimberly-Stevens Corp., New Milford, Conn.

Ray Simmons has been appointed overseer of spinning at the Foster Plant, Alice Mfg. Co., Easley, S. C.

P. S. Smith has been elected president of Globe Mills Co., Mount Holly, N. C.

Robert M. Stroker has been named general manager of the Automotive Div. and a director of Collins & Aikman Corp., New York.

J. C. Summerell has been recently promoted to senior vice president and sales manager of Wunda Weve Carpet Co., Greenville, S. C.

Antel Varas has been promoted to vice president of Wunda Weve Carpet Co., Greenville, S. C.

OBITUARIES

Charles L. Amos, Sr., 76, founder and chairman of the board, Melrose Hosiery Mills, Inc., High Point, N. C.

Martha J. Davis, 52, secretary, Charleston Hosiery Mills, Cleveland, Tenn.

Theophile Guerin, 87, retired president and general manager of the former Guerin Mills Inc., Woonsocket, R. I.

Irvin H. Hamilton, 63, vice president and director, Schlichter Jute Cordage Co., Philadelphia.

Clifford B. Hayes Sr., 65, retired vice president and director, Pacific Mills, division of Burlington Industries, Inc., New York.

Erwin A. Holt, 87, retired executive, Lawrence S. Holt & Sons, Asheville, N. C.

Rinaldo A. Lukens, 67, former president, Continental Mills, Inc., Philadelphia.

Joseph K. Milliken, 86, founder and retired president of the former Mount Hope Finishing Co., North Dighton, Mass.

Arthur Molyneux, 80, retired president, Madison Spinning Co., Inc., Philadelphia.

Charles F. Orr, 90, who had retired as general manager, Waverly Braid Mills, Inc., Gastonia, N. C.

Richard S. Paige, 57, partner, former Frank E. Paige & Co., Needham Heights, Mass.

William J. Pharr, Jr., 31, an executive of Stowe Mills, Inc., Pharr Worsted Mills, Inc., and Pharr Yarns, Inc., McAdenville, N. C.

Benjam S. Phetteplace, 66, retired general manager, Franklin Process Co., Greenville, N. C., a division of Indian Head Mills, Inc.

Charles Taylor, 78, retired president and founder of the former Lowell Top Dye and Print Works, Lowell, Mass.

Benjamin L. Whittier, 62, professor, North Carolina State College School of Textiles, Raleigh, N. C.

T. Henry Wood, 65, manager, Oconee Mills, Inc., Westminster, S. C.

9 billion dollars to build a better one.

We're living in a needing, buying, growing America—a time for new and improved products and services—the creation of new jobs. More than ever, a businessman with an idea, with the urge for something better will move ahead with our expanding economy.

But after the idea, what follows can be a costly period of research and development. Not necessarily—if you use the immense 9-billion-dollar fund of research and patent information that's available at your U.S. Department of Commerce. Think of the saving—in time and money.

For example: there are reports on extensive research by your Government in new products and processes. A translation of data on inventions and discoveries abroad—information on over 3 million patents—a fortune in patents owned by your Government. All this is yours—for your use and your benefit.

Take advantage of the many ways in which your business can grow. In developing new products and services. In the lucrative foreign markets. In new U.S. markets. In attracting new industry to your local community. Just phone or write the U.S. Department of Commerce Office of Field Services in your city, or Washington 25, D.C. Your U.S. Department of Commerce is always ready to help you grow with America!

NOW'S THE TIME TO GET GROWING IN A GROWING AMERICA!

FLORIDA AND ALABAMA OPENINGS

TEXTILE, MECHANICAL AND CHEMICAL ENGINEERS

PROCESS IMPROVEMENT

The Chemstrand Corporation—producer of Acrilan® acrylic fiber and Chemstrand nylon—needs B. S. graduate engineers with up to five years process assistance or improvement experience in the chemical, textile or chemical textile processing industries for openings in Decatur, Alabama and Pensacola, Florida manufacturing operations.

Assignments involve process and product improvement and modification and technical assistance in day-to-day process problems. Excellent working conditions and supervisory advancement opportunities in well-equipped plants. Attractive southeastern communities on TVA lake in Alabama and on Florida's Gulf Coast offer pleasant, mild climate, enjoyable living, good schools, and plentiful recreational opportunities.

Send resume of education, experience and salary history and requirements in confidence to: **Manager, Employment-Recruitment, Box ENG-1, The Chemstrand Corporation, Decatur, Alabama**

THE CHEMSTRAND CORPORATION

DECATUR, ALABAMA

FOR SALE

TENTER FRAME & HEAT SETTING UNIT

1—James Hunter Tenter Frame
8-pass single cabinet. Fabric width 38"—72". Fully automatic. Now running on tricot, but also suitable for woven woolens and other fabrics.

1—McCreary Heat Setting Unit
72" x 72". Recently rebuilt. Attached to above dryer, can be added to any other tenter.

Both machines available soon—together or individually.
Inquiries welcome.

SIMPLEX TEXTILES LTD.

Prescott, Ontario — WAlnut 5-2882

CIRCLE 400 ON READER SERVICE CARD

FOR SALE

42—Warner and Swasey "Sulzer" Automatic Shuttleless

Looms, 80" wide; 16 looms with 25 harness Staubli Heads, pick & pick motions, also 8 harness cams; 26 Looms standard 8 harness cam motions. Beams, shuttles, harness frames, heddles, drop wires, supplies, etc.

Do not miss this opportunity. Priced exceptionally low for such good equipment.

INTERSTATE TEXTILE EQUIPMENT CO., INC.

P.O. Box 3371 CHARLOTTE 3, N. C. Tel. 375-7702 • EMPIRE STATE BLDG., New York 1, N. Y. PEnn. 6-0451

CIRCLE 424 ON READER SERVICE CARD

Buy and Sell
Used Textile Machinery
of any description

JACOB SALT, 421 7th Ave., N. Y. C.
or P. O. Box 1535 Paterson, N. J.
NY Phone CHickering 4-8556

CIRCLE 427 ON READER SERVICE CARD

ASSISTANT MANAGER

for dyestuff application Lab. Applicants with good overall experience and special knowledge of vat dyeing preferred. Located in New Jersey.

P-7074, Textile World
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

FOR SALE

Good Machinery—Low prices

2—Air Perme-ator Humidifiers.
1—VV Clip Tenter Frame 50' x 60".
1—VV Palmer—60".
1—Sipp E. Hy Speed Warper 83".
S.S. Dye Jiggs 50" & 60".
1—VV 3 Roll Calender 60".
Cottage Steamer—8' x 12'.
33—Spdle Whitin Schweiter Auto Quillers.
1—RB&F 44" 5 color print machine.
1—Hinnekins Moire Calender 50" New.
1—Hercules Extractor 50" Copper Basket.
1—Johnson Sizer, 5 Copper Cans 66".
1—Uster Portable Elec Knot Tier 72".

STAVE & KESSLER
106 Kearney Street
P. O. Box 1611 — Paterson 16, N. J.

CIRCLE 428 ON READER SERVICE CARD

COLORIST

An old and solid New England Print Works needs the services of an additional Colorist. He must be experienced and thoroughly capable of close color matching, and keeping the Print Machines running. He must be familiar with the use of Vats, Pigments, Fiber Reactives, Rapidogens, etc., and application to all cotton fabrics (no mixtures).

This position is an addition to our staff and not a replacement. Our own people know about this ad.

Please send full particulars of your qualifications in first letter.

Salary commensurate with the responsibility. All applications will be held in strict confidence.

P-7032, Textile World
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

POSITIONS VACANT

Wanted—Research Engineers. Openings in research division for textile engineer, mechanical engineer, or fiber physicist; experience in textile manufacturing, fiber, testing or research desirable; opportunity to develop wide contacts with leading textile scientists and executives; location Washington, D. C. Send complete resume and salary requirements to: National Cotton Council of America, Utilization Research Division, Room 502, Ring Building, 1200 18th Street, N.W., Washington, D. C.

Wanted: Textile Finishing Technician to work in Philippine Cotton Mill. Must have experience in indigo and package beam yarn dyeing. P-7083, Textile World.

Production man required capable of laying out complete units for the manufacturing of surgical dressings, adhesive tape, and plastic bandaid type products. Must be able to specify machinery and supervise installation and start-up. Working knowledge of adhesives necessary. Please send resume. P-7040, Textile World.

Philippine Islands Mill wants Supt. Textile Technician for spinning, weaving & preparation for synthetics. State experience fully. P-6993, Textile World.

Quality Control assistant: Young man, B.S. degree in textiles wanted to work in development and lab analysis. A few years lab experience desirable. Growth position in New Jersey. Write stating qualifications and salary to P-7021, Textile World.

POSITIONS WANTED

Foreign Assignment Wanted—Textile Technician 41 yrs. old with 20 yrs. experience in bleaching, dyeing, printing & finishing all fabrics. PW-6960, Textile World.

Weavingmaster—age 32 years—with many years experience as Supervisor, Loomfixer and Quality Controller in one of the biggest weaving mills in the time of rebuilding in West Germany wants position as a weaving expert, in South or North America. Well educated in automatic weaving. At present in charge of a newly erected Automatic-Woolen-Mill. Experienced in wool, cotton, art silk and synthetic fibers. PW-6991, Textile World.

Tricot Technician Designer. Production background, vast experience, novelty fabrics, angel laces. Competent seasoned executive. Raschel and finishing experience. Consider offers where capabilities fully utilized. References. PW-7116, Textile World.

Textile Chemist, P.T.I. graduate, 9 years diversified experience laboratory & quality control work, U.S. & Abroad, seeks challenging position U.S. firm, possibly foreign technical service. 3 foreign languages fluently spoken. Reply PW-7152, Textile World.

Designer, Manager, cotton, wool, synthetics, mechanically inclined, original ideas, linquist, college education, seeks domestic or foreign challenge. PW-6448, Textile World.

Extraordinary Liquidation!

THE MODERN DYEING AND PRINTING MACHINERY OF THE FORMER EUREKA PRINT WORKS, CLIFTON, N. J.

BLEACHING

1 Morrison Continuous Rope Bleaching unit consisting of
8 Rodney Hunt Stainless Steel Tensitrol Rope Washers
1 Morrison Stainless Steel Peroxide Saturator
1 Morrison S.S. J. Box, 24'
1 Weisner-Rapp S.S. Continuous Rope Bleaching Unit consisting of
1 Weisner-Rapp J Box, 20' high
1 Aluminum Peroxide Tank, 5000 gals.
24 Allen Kiers

MERCERIZING

1 Butterworth Mercerizing Unit consisting of 60' frame wash unit, singers, 3 roll padder, recuperator, new chain, MG set.

FINISHING

34 S.S. Dry Cans 90 x 30" dia.
1 Proctor & Schwartz Roller Cure Dryer 24'
1 Butterworth 90' Enclosed High Speed Tenter Frame, Proctor & Schwartz housing
1 Butterworth 80' Enclosed High Speed Tenter Frame and housing
1 Textile 70' Enclosed High Speed Tenter Frame and housing
1 McKiernan-Terry Combination Schreiner, Friction and Rolling Calendar, 50 ton
1 Perkins 3 roll 100 ton Hydraulic Calendar
2 Perkins 5 roll 50 ton Calendars
1 Proctor & Schwartz Gas Fired Loop Curer
1 Morrison Rubber Belt Compressive Shrinkage Range, Reliance drive
61 S.S. Dry Cans 47", 30 lbs. pressure
44 S.D. Dry Cans 142 x 23" dia.
1 Cocker Indigo Dye Range, 1948

WASHING AND DYEING

1 3 roll Morrison Padder, motor
1 Morrison Continuous Dye Range consisting of predryer, 3 roll padder, microset,
8 compartment wash unit, 24 dry cans, MG set
1 S.S. 4 compartment Open Width Washer
1 Burlington S.S. Beam Dyeing Unit
8 Textile & Werner S.S. Dye Jiggs 50" to 70"
13 S.S. Dye Boxes, 4'-12'

PRINTING AND AGEING

1 Proctor & Schwartz Loop Ager, 1954
1 Rice, Barton & Fales 50" 10 color Print Machine
1 Rice, Barton & Fales 8 color Super Precision Print Machine 50"
5 Rice, Barton & Fales and Textile 8 color Print Machines 50" to 66"
4 Vat Agers, brass rolls
1 R. B. & F. Mandrel Jack
3000 Engraved Copper Rollers

OTHER MODERN
TEXTILE MACHINERY

87 Draper XD Looms, 54" reed, Diehl and motor, 1947-51

56 Universal #10 Uptwisters, 184 spdls. 2 lbs. headless package, 1950

56 C & K Big 6 S6 Looms 56" b.s. 1948

Republic
TEXTILE EQUIPMENT COMPANY

APPRAISALS
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PURCHASE AND SALE TEXTILE MACHINERY
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LIQUIDATION OF MILL PROPERTIES

40 Worth Street, New York 13, N. Y. • COrtlandt 7-1590

CIRCLE 402 ON READER SERVICE CARD

LIQUIDATING

PRICES SLASHED

Modern Dyeing & Finishing Machinery of Ming Toy Dyeing Co., Paterson, New Jersey

MUST VACATE BUILDING

1—64" x 70' Enclosed Tenter Range, gas heated, 60' Housing, Pneumatic Padder, Pre-Heater, Heat Setting Roller Curer, Hydraulic Batcher, Auto. Cut-Off.

1—Tenter Frame 50' x 60" with S.S. Clips.

1—Tenter Frame 60' x 50" with S.S. Clips.

2—Werner 60" & 50" Pneumatic Padders, 2 rubber rolls.

1—Morrison Tenter 50" x 50', S.S. Clips.

2—50" V.V. 3-roll Calenders.

1—52" Hinnekens Boil-Off.

1—Open Width Washer 65", 3 compartments, 3 sets of rubber squeeze rolls.

1—62" Textile Singer, reversible.

3—Merrows 60 D3B with tables & motors & 2—Merrows 60 D3B on tracks.

1—V.V. 73" Decatur.

1—60" and 1—54" V.V. Tubers.

3—Werner 70" S.S. Jiggs.

4' to 12' S.S. Lined Dye Becks.

3—51" to 62" Beamers.

6—10' and 12' S.S. Oval Reels.

1—V.V. 54" Embosser.

1—Maxon Heater.

1—2 ton Chain Hoist.

3—Water Softeners, fully automatic, 10' x 10', 8' x 10'.

1—750 H.P. Boiler, Steam Generator, Water Walls, 80,000 lbs. Steam per Hr.

3—Filter Tanks.

Machine & Carpenter Shop Equipment.

Office & Miscellaneous Equipment.

Building for sale or rent, 85,000 sq. ft. Sprinklered, free water.

A & M BLANK CO., INC.

301-313 East 22nd St. (at 7th Ave.) Paterson, N.J.

SHerwood 2-1367-8

CIRCLE 403 ON READER SERVICE CARD

1-TINIUS OLSEN STRENGTH TESTER 0-60,000 LBS.

3—Atwood 10B—6" Trav.—6" Gauge—4½" Rings

6—S.S. ROTARY & PADDLE DYERS—100-400 LBS.

3—Fidelity Reelers—2 Arms
1—Arnold Rubber Covering Machine
11—Unirails—Model 501
8—U. S. HDless Pkg. Twisters
70—Foster 75A Winders
6—Balling Machines

S.S.Skein Dryers—1-12, 1-10, 1-7 Arm
4—Tubers w/Yardage Clocks
10—Atwood & Sipp Redraws
1—15' Carpet Dryer with Scrim
4—H&W Steam Boxes
1—Haskell & Dawes Circular Twisters

100 UNIVERSAL NO. 50 WINDERS

BOBBINS—SPOOLS—QUILLS—*All Sizes & Types*

PENNSYLVANIA SPOOL & EQUIPMENT CO.

425 LEHIGH ST. ALLENTOWN PA. Phone HE 3-7545

Complete mill for making rope. Complete mill for a slitting & reinforcing metallic yarns.

CIRCLE 404 ON READER SERVICE CARD

NOW IS THE TIME TO BUY

154—XD 48" 20-harness dobby Draper Looms
80—XD 56" 20-harness dobby Draper Looms
72—S-6 56" B/S 2 x 1, C&K Looms
20—XK 44" TAFFETA motion, Draper Looms
5—#50 Universal Cone Winders
2—Whitin Speed-O-Matic Quillers, 1956
200—Abbott Quiller motors & other parts
12—Deliveries Whitin Hi-coil drawing, 1949
4—Whitin 1949 Lap Winders
2—Johnson slashers, 7 can, Teflon
1—Magnesium Sipp Warper, 600 end creel
2—Warpers & 1000 end creels, Reiner & Sipp
1—Universal creel, 350 ends
1—Sipp-Eastwood creel, 700 ends
6—Bobbin Strippers, K & L, also roving
2—Tensionless Batchers, DC
6—B/C warp tying mach., LC LS LL K
1—Cloth Trimmer, 72", with Kaumagraph
22—#7 Dobbies, ⅝ gauge, 16 harness & arches
7—Draper E looms, 50" cloth

SUPPLIES

10—SS tanks & kettles, up to 1000 gal
5000M—Stop Motion Drop Wires, all types
15M—Single & double rod harness frames
2000M—Heddles, 10-16". Also selvage heddles
500M—Quills, 3, 5, 6 butt, all lengths
750—NEW hank clocks & used pick clocks
200—Parks-Cramer humidifier heads
6—S.S. Hook Reeds, 8-15 dent
500—Electric Stop motions and parts
8000—Gates Rubber & Dance Canvas Lug Straps
3000—Gates Texhide and rawhide pickers
15,000—Pick Gears for E, K, XD, XK Looms
50—Motor Drives for Model E Looms
300—Loom beams 24", #6 pitch heads, 44" b/h

SHOP EQUIPMENT

Lathes, Milling machines, Grinders, Buffers, Air Compressors, Conveyors, Trucks, Motor & Switches. 1000 ft. loom beam or lap handling track.

MACHINERY SALES CORP.

131 Court St., P.O. Box 367
New Bedford, Mass., Tel: Wyman 9-6273

CIRCLE 405 ON READER SERVICE CARD

WE OWN AND OFFER

750—Seamless Fibre Roving Cans 14 x 36
51—Draper Adj. Steel Beams, 26" dia—46" XD
34—C&K #7 Dobby Heads—20 Harness—AD
2—Terrell "L" Bobbin Strippers—Hoists
1—B.C. 15" Knotten—Model LL—Motorized
1—B.C. 56" Knotter—Model LL—Motorized
1—JOHNSON 7 Can Slasher 30x60 S/Steel
9—N.E. Butt #3 Braiders—16 Carrier
2—W.W. Compressor Magazine Creels 600 L. Ends
25—Walton 110V Humidifiers—Reconditioned
200—Pair Draper Flanges 22" dia., 130T-8 Pitch
250—Veeder Root Three Shift Pick Counters
500M—Artex Stainless Steel Heddlers 12-13-14"
25M—Harness Frames for above—46-80" long.

"LARGE WAREHOUSE STOCK OF MISCELLANEOUS TEXTILE SUPPLIES & EQUIPMENT"

PAWTUCKET MILL SUPPLY CO., INC.

240 YORK AVE., PAWTUCKET, R. I.

CIRCLE 406 ON READER SERVICE CARD

WE OFFER

1—65" Morrison Calender
1—60" Morrison Calender
1—65" Morrison Button Breaker

Condition guaranteed

JOHN VERDUIN MACHINE CORP.

351 Tenth Avenue, Paterson 4, New Jersey

SHerwood 2-9789

CIRCLE 407 ON READER SERVICE CARD

FOR SALE

1—Economy #654 Baling Press, 27" x 54" bales.
1—Economy #127 Baling Press, 27" x 54" bales.
1—Logemann Skein Baling Press.
1—Logemann hand Baler 36" x 24" bales.
1—Lummus double box downstroke Baling Press.
3—Fidelity 72" Skein Reelers.
1—National Loop Dryer, 5 fans, 560 lbs. hour.
40—3½" mod. K Ladies Seamless kfg. machines.
1—Grand Rapids Knit Goods Steamer 220V mtr.
124—Steel Lockers double tier or door type.
1—Kastrinsky 56" Calender with folder & hood.
1—Suter Seriplane 10 ends with boards & rack.
2—Scott model DH Yarn & Cloth Testers
4—Whitin wet Twisters, 5" ga. 3²/₄" rings.
1—Tinius-Olsen Break Tester 60,000 lbs. cap.

A. BENSON (Ben) DAVIS & ASSOCIATES

P.O. Box 11,112 Charlotte 9, N. C.

Ja-3-7721

CIRCLE 408 ON READER SERVICE CARD

UNEXCELLED QUALITY IN REBUILT AND USED TEXTILE EQUIPMENT

We have excellent reconditioned, rebuilt and used winding and textile equipment at considerable saving to you.

Check with us on your requirements

Standard Mill Supply Co.

31 Esten Ave., Pawtucket, R.I.
Phone PA 3-1534

CIRCLE 409 ON READER SERVICE CARD

WE OFFER FOR SALE

1—#12 Opener with #11 Condensor
1—Johnson 9 Can SS Slasher, Pneu. Quetch
1—Collins 180 Sp. Fancy Twister, Double Line Rolls
20—44" XK Looms, Plain Harness Motion
3—Revolvator Port. Hoists, 750 & 1800 Lbs.
1—26" S & W Pinking Machine
60M—14" Drawtex Heddles in 51" Frames
1—Ideal Stencil Cutter, 5/8" Letters
28—S. S. Tanks & Kettles, 20-3500—Gal.
5—H-1 PIV's, 2:1, 4:1, 6:1
300—Barber Colman Section Beams, 54½"X26"
5—Barber-Colman Port. Warp Tying Machines
Bobbins, Quills, Heddles, Drop Wires, Motors, Variable Speed Drives, Hoists

INDUSTRIAL MACHINERY CO.

32 Boomer Street P. O. Box 261
Fall River, Mass. Osborne 4-8161

CIRCLE 429 ON READER SERVICE CARD

LIQUIDATION

Our liquidation at the SAMUEL HIRD & SONS, INC., plants is continuing. Due to real estate commitments it is particularly desirable to move the items at the Cornelius N. C. mill.

AT CORNELIUS, N. C.

455 FIBRE CANS, 15x36 and 15x42. Some springs.
30 W&S FALLERS, 18 P.P.I., for M-3680 machines.
5 WORSTED ROVERS, 10x5, 72 spdls. each. M.D's.
1—WHITIN MDL G10DW, QUICKSET, yr. 1960.
4—S-L MDL F-5, yr. 1953-4.
6 WHITIN 240 spdl. x 4" ga. x 3" ring PIEDMONT WORSTED SPINNING FRAMES, MDL. KW, YR. 1960.
15 S-L 240 spdl. x 4" ga. x 3" ring GWALTNEY WORSTED SPINNING FRAMES, MDL SS4-G, yr. 1954-6.
2 H&W YARN CONDITIONERS, type ST-3, yrs. 1941 and 1949.
1 WHITIN 36 spdl. "FILLMASTER" AUTO FILLING WINDER, MDL MSV, yr. 1956-1960.
2 TERRELL MDL. L BOBBIN STRIPPERS, chutes, conveyors, hoists.
1 FOSTER 100 spdl. DOUBLER, MDL 57, 7" traverse.
1 TERRELL MDL K BOBBIN STRIPPER.
1 NEMO JET STARCH COOKER.
1 WHITIN HIGH SPEED DRESSING OUTFIT with Universal 400 live end magazine creel, Entwistle dry hack stand, 110" drum reel—model K, WCM beamer and compressor.
24 C&K 82" MDL. W-2 AUTO WORSTED LOOMS.
42 C&K 82" MDL. W-3 AUTO WORSTED LOOMS.
1 OPEN WIDTH CLOTH MEASURING and ROLLING MACHINE, 80½", M.D.
1 CLOTH DUSTING and BRUSHING MACHINE M.D., including filter
1 P&W 72" Uxbridge Type POWER INSPECTING PERCH, backlighted, M.D.
34 BURLING TABLES, 84" wide, lights.
1 FOLDING MACHINE, 80", M.D.
1 TENNANT POWER SWEEPER, Mdl. 53, type G, gasoline powered.
Lot MISC. Metal and fibre boxes, lift trucks, scales, machine shop equipment, office furniture and equipment, CLARK 6000 lb. FORKLIFT TRUCK, electrified monorail tracking, etc.

AT GARFIELD & CLIFTON, N. J.

10 S-L 240 spdl x 4" ga x 3" ring GWALTNEY WORSTED SPINNING FRAMES, MDL SS4-G, yr 1954.
7 PRINCE SMITH 200 spdl x 3¾" ga x 2½" ring WORSTED SPINNING FRAMES, Pneumafils, long draft, 11" traverse, MD's.
9 WORSTED SPINNING FRAMES, S-L and P.S., 200 spdl, 4 with long draft, 8—3½" ga.
1 TERRELL BOBBIN STRIPPER, TYPE L, MDL S-4, chute, dumper, conveyors, ALL YR. 1959.
1 WHITIN 48 spdl "FILLMASTER" AUTO FILLING WINDER, MDL MSV, yr 1956.
1 H&W YARN CONDITIONER, Type ST-3, yr 1950.
5 WHITIN 200 spdl x 3" ring TWISTERS, M.D.'s.
2—MDL BJ-2, trap, 4" ga.
1—MDL BJ-2, double roll, C-1 fancy yarn attachment, 4" ga.
2—MDL BB, NOVELTY, 4½" ga.
3 S-L 168 spdl x 3¾" ga x 3" ring DOLLY ROLL TRAP TWISTERS, 11" traverse, M.D.'s.
1 WHITIN HIGH SPEED DRESSING OUTFIT with Universal 400 live end magazine creel, Entwistle dry hack stand, 110" drum reel—model K, WCM beamer and compressor.
1 D&F 84" PIN TYPE DRESSING REEL with electric stop motion and air brake, 180 end creel, dry hack stand, beamer.
1 TITAN WARP TYING MACHINE, MDL GK6B, complete with stands for up to 84" warps. All yr. 1959.
1 S-L HOT AIR SLASHER, complete with beam creel, size boxes, headway, etc.
24 C&K 82" MDL W-3 CONVERTIBLE WOOLEN LOOMS, now 4x2 select-a-pick, parts to convert to 4x1.
24 WARNER & SWASEY 80½" SULZER WEAVING MACHINES, pick & pick.
1 CLOTH DUSTING and BRUSHING MACHINE, M.D., including filter.
1 C&M DOUBLING and TACKING RANGE.
4 HUNT EXPRESS FULLING MILLS.
1 HUNT 78"x6 bowl SS TENSITROL OPEN WIDTH CLOTH WASHER, yr. 1950.
4 HUNT 10' CLOTH WASHERS, wood rolls.
1 BIRCH 72" VACUUM EXTRACTOR, vacuum pump, M.D.
1 KENYON 72" PIN TENTER CLOTH DRYER, multi-pass.
2 P&W 66½" CENTURIAL SHEARS, 4 and 5 blade.
1 SJOSTROM CLOTH CONDITIONER.
1 MT. HOPE DETWISTER.
1 BUTTERWORTH 82"x4 BURNER SINGER, complete.
1 P&W 66½" MANAYUNK OPEN WIDTH CLOTH MEASURING and WINDING MACHINE, air guiders, Trumeter, pneumatic arbors, M.D.
1 P&W 66½" DOUBLING, MEASURING, and WINDING MACHINE, M.D.
12 BIRCH 72" POWER INSPECTING PERCHES.
1 HUNT 8' SS totally enclosed PIECE DYE KETTLE, hump reel.
Lot MISC. Scales, sewing machines, boxes and material handling equipment, electric mixers, machine shop equipment, etc.

We also offer the following selected items from other locations

1 SARGENT 60"x5 BOWL SCOURING TRAIN, complete with 8'x8 section dryer and motor drives throughout. All yr. 1949.
1 SARGENT 72" AUTOMATIC BOX DUSTER, complete with hopper feed, fan, and motor drives. All yr. 1950.
11 JAMES SMITH & PRINCE SMITH NOBLE COMBS. Also large quantity spare circles.
2 SARGENT ELECTRIC TOP PRESSES, yr. 1949 & 1953.
1 D&F 48" FEARNAUGHT MIXING PICKER with BRAMWELL 54" FEED BOX, all yr. 1954.
2 R&L 200 lb. SS. SPECIAL RAW STOCK DYE KETTLES, controls, pumps, and motor drives, all yr. 1958.
1 FRANKLIN 500 lb. SS PRESSURE RAW STOCK DYE KETTLE.
1 R&L 100 lb. SS PRESSURE RAW STOCK DYE KETTLE, yr. 1953.
1 SMITH DRUM 300 lb. SS ROTARY DRUM DYEING MACHINE.
2 VENANGO SS PRESSURE PACKAGE DYE KETTLES, 144 spdls. ea. Unit complete with all parts, Fletcher extractor, and dryer.
1 Set SARGENT 30" PNEUMATIC RAW STOCK SQUEEZE ROLLS, with hopper feed and motor drives.
1 TOLHURST 48" SUPREX EXTRACTOR, SS basket.
1 SARGENT 44"x2 section RAW STOCK DRYER, SS apron, SS hopper feed, motor drives. All yr. 1956.
11 PROCTOR & SCHWARTZ 60" AUTOMATIC CARD FEEDS, Models 535, 657, & 657B.
2 D&F 48" BROADBAND INTERMEDIATE CARD FEEDS.
4 J&B 360 spdl.x2¾" ga. GIANT PACKAGE MULES, yr. 1946-7.
1 ATWOOD 100 spdl.x7" ga.x4¾" ring MODEL 10 TWISTER, 8" traverse, M.D.
3 WHITIN 100 spdl.x7" ga.x5½" ring MODEL D TWISTERS, 8" traverse, M.D's.
3 ABBOTT 60 spdl. MODEL 65 AUTOMATIC WOOD CONE WINDERS, yr. 1952.
1 ABBOTT 142 spdl. MODEL 65 WOOD CONE WINDER, yr. 1954.
1 D&F 40"x40 end MODEL 60 HIGH SPEED JACKSPOOLER, yr. 1951.
1 CALLOWAY SAMPLE SLASHER, double size box, air dryer. YR. 1960.
2 UXBRIDGE GENTLE AIR SLASHERS, complete.
30 DRAPER 72" MODEL XD LOOMS, 82" R.S., 6 harness can motions, yr. 1953.
4 C&K 82" MODEL W-3 CONVERTIBLE WOOLEN LOOMS, LO #16556.
1 HUNTER #21 FULLING MILL, rubber rolls, pneumatic pressure, ss traps, ss throats, M.D.
1 HUNTER #11 SS FULLING MILL, rubber rolls.
1 HUNTER 69"x14" dia. RUBBER ROLL CLOTH WASHER, pneumatic loading, M.D. Yr. 1951.
1 MT. HOPE AUTOMATIC DETWISTER, complete with 72" floor turntable.
1 HUNTER 40"-72"x10 pass PIN TENTER CLOTH DRYER, 2 section, overfeed, side fans, motor driven throughout.
9 D&F NAPPERS.
2—90"x14 roll, S.A., M.D. yr. 1930 & 1949.
4—100"x14 roll, S.A., yr. 1945.
2—100"x24 roll, D.A., yr. 1946.
1—110"x24 roll, D.A., M.D.
1 P&W 72" CROPPING SHEAR, yr. 1951.
1 P&W 80½" DAVIDSON SHEAR, sgl. blade, yr. 1957.
1 C&M 66½"x4 cyl. BRUSHING and SANDING MACHINE, M.D.
1 P&W 72"x60" dia. SEMI DECATER, Nash Hytor L-6 Vacuum Pump, M.D.
1 WINDLE 82" OPEN WIDTH CLOTH MEASURING and ROLLING MACHINE, type OR #2, yr. 1955.
1 INGERSOLL-RAND 12x8 AIR COMPRESSOR, type ES-1, 35 lb. pressure, yr. 1954. 40 H.P. M.D.
1 BRAEBENDER MOISTURE TESTER, type FD-5, with scale.

—ALL OFFERED EXCLUSIVELY BY—

FRANK G. W. McKITTRICK CO.

Established 1922 — Incorporated 1935

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Charlotte 1, N. C.
Phone 376-5676

CIRCLE 411 ON READER SERVICE CARD

LIQUIDATION

GARNERVILLE, NEW YORK HAverstraw 9-9224

2—PALMER-TENTER PAD RANGES WITH PREHEATERS, DRY CANS & BATCHERS 90'—110'

1—PNEUMATIC PADDERS 60"

2—BS CALENDERS 50"—55" W/SPARE ROLL

2—DOUBLE PUMP DECATIZERS

5—VV TENSIONLESS TUBERS 50"—70"

1—20 FAN NATIONAL LOOP DRYER 104"

22—DYEBECKS, WOODEN SS LINED WITH COVERS

2—SAMPLE ENCLOSED DYE BECKS

1—48" SS EXTRACTOR

1—HINNEKENS 60" BOILOFF

3—WERNER 50" PNEU. EMBOSSERS W/INKING ATTACH.

1—VERDUIN 50" GLAZING & FRICTION CALENDER

14—DYE JIGGS 60"—70" WITH AND WITHOUT COVERS

COMPLETE MACHINE SHOP, LABORATORY AND OFFICE EQUIPMENT; ALL AUXILIARY EQUIPMENT SUCH AS TRUCKS, SPARE PARTS, PAILS, ETC.

41—35 LB. SS CANS 70"—110"

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SEARCHLIGHT:			400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	
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EQUIPMENT AND SUPPLY NEWS:				E1	E2	E3	E4	E5	E6	E7	E8	E9						
E10	E11	E12	E13	E14	E15	E16	E17	E18	E19	E20	E21	E22	E23					
E24	E25	E26	E27	E28	E29	E30	E31	E32	E33	E34	E35	E36	E37					
E38	E39	E40	E41	E42	E43	E44	E45	E46	E47	E48	E49	E50	E51					
E52	E53	E54	E55	E56	E57	E58	E59	E60	E61	E62	E63	E64	E65					
E66	E67	E68	E69	E70	E71	E72	E73	E74	E75	E76	E77	E78	E79					
E80	E81	E82	E83	E84	E85	E86	E87	E88	E89	E90	E91	E92	E93					
NEW LITERATURE:				L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11				
L12	L13	L14	L15	L16	L17	L18	L19	L20	L21	L22	L23	L24	L25					
L26	L27	L28	L29	L30	L31	L32	L33	L34	L35	L36	L37	L38	L39					
L40	L41	L42	L43	L44	L45	L46	L47	L48	L49	L50	L51	L52	L53					
DYES & CHEMICALS:				D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11				
D12	D13	D14	D15	D16	D17	D18	D19	D20	D21	D22	D23	D24						
ADVERTISERS' LITERATURE:				A350	A351	A352	A353	A354	A355	A356	A357	A358	A359					
A360	A361	A362	A363	A364	A365	A366	A367	A368	A369	A370	A371	A372	A373					
A374	A375	A376	A377	A378	A379	A380	A381	A382	A383	A384	A385							
REPRINTS:		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12					
A13	A14	A15	A16	A17	A18	A19	A20	A21	A22	A23	A24	A25	A26					
A27	A28	A29	A30	A31	A32	A33	A34	A35	A36	A37	A38	A39	A40					
A41	A42	A43	A44	A45	A46	A47	A48	A49	A50	A51	A52	A53	A54					

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19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
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E24	E25	E26	E27	E28	E29	E30	E31	E32	E33	E34	E35	E36	E37					
E38	E39	E40	E41	E42	E43	E44	E45	E46	E47	E48	E49	E50	E51					
E52	E53	E54	E55	E56	E57	E58	E59	E60	E61	E62	E63	E64	E65					
E66	E67	E68	E69	E70	E71	E72	E73	E74	E75	E76	E77	E78	E79					
E80	E81	E82	E83	E84	E85	E86	E87	E88	E89	E90	E91	E92	E93					
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L12	L13	L14	L15	L16	L17	L18	L19	L20	L21	L22	L23	L24	L25					
L26	L27	L28	L29	L30	L31	L32	L33	L34	L35	L36	L37	L38	L39					
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A360	A361	A362	A363	A364	A365	A366	A367	A368	A369	A370	A371	A372	A373					
A374	A375	A376	A377	A378	A379	A380	A381	A382	A383	A384	A385							
REPRINTS:		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12					
A13	A14	A15	A16	A17	A18	A19	A20	A21	A22	A23	A24	A25	A26					
A27	A28	A29	A30	A31	A32	A33	A34	A35	A36	A37	A38	A39	A40					
A41	A42	A43	A44	A45	A46	A47	A48	A49	A50	A51	A52	A53	A54					

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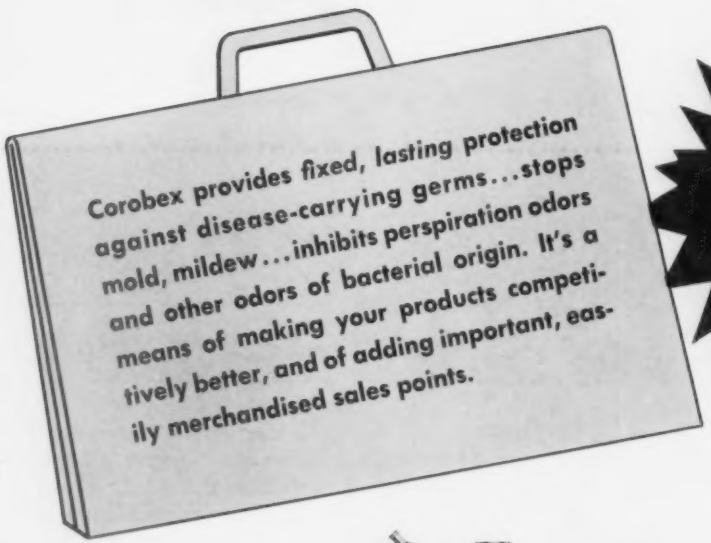
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